MARCH 1995
Volume 63 No 3

AMATEUR RADIO

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles including

* An Adjustable Audio Filter System for the Receiver
* A 240 Volt AC Line Monitor
* Part 1 of An L of a Network

Plus lots of other articles and special interest columns

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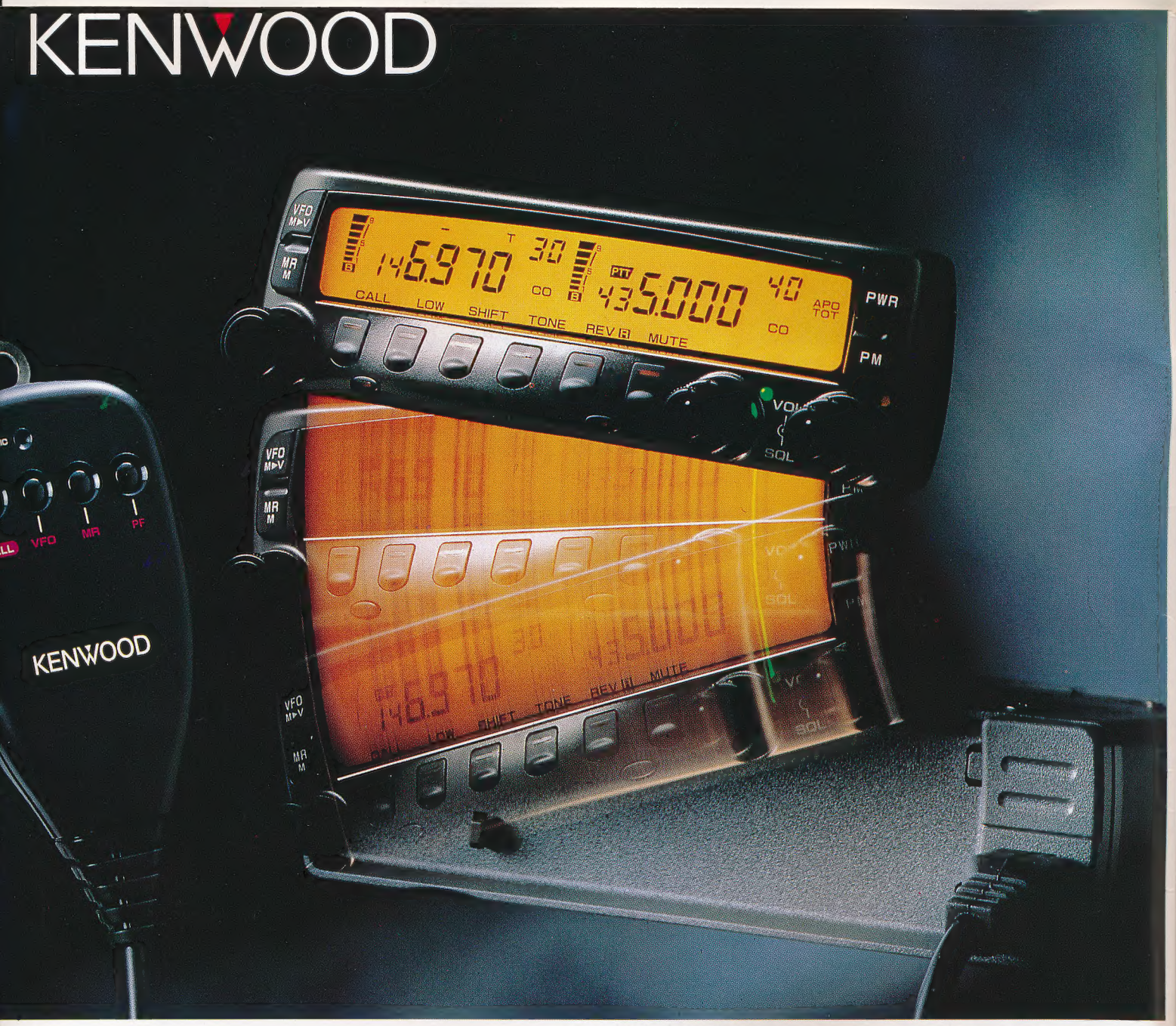

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Cover

Long time WIA Victoria broadcast announcer Rolf Fox VK3JWL presents the news from the Lyndhurst studio and transmitter site of VK3BWI.

(Photo by Ron Fisher VK3OM)

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

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Editor's Comment

Publication Delays

From time to time, members who have submitted articles to us for publication enquire when their article might be printed. This question came up on a recent visit to one of our more prolific contributors, and it seemed a good idea to summarise, for all to read, the essence of that conversation.

There are factors which help publication to be in the ideal sequence, which is in the order received from contributors.

These are:

Presentation; preferably on computer disk, well set-out, perfect grammar and spelling, diagrams professionally drafted, relevant photographs (preferably prints).

Topicality; relating to techniques or activities of current interest to most amateurs. If commenting on political topics, without bias and in no way offensive to anyone.

Availability of space; regrettably this can delay even the most perfect submission. Space is always limited, some months more than others.

On the other hand, there are factors which can produce tremendous delay. Most of these are obviously converses of the accelerating factors, eg scruffy, ungrammatical and hand scribbled. But there is one in particular; being a non-member of the WIA. *Amateur Radio* magazine is (or should be) of, by and for our members. So, members have automatic preference over non-members. Rarely, we receive from a non-member something so good and topical that we must publish it. But not very often!

I could go on, for example about the time and cost involved in having diagrams drafted, but I'm sure you are all getting the message. We look forward to seeing your work!

Bill Rice VK3ABP
Editor
ar

WIA News

Award for *Amateur Radio* Correspondent

Amateur Radio magazine correspondent, Eric Jamieson VK5LP, has been awarded the WIA's G A Taylor Medal for writing the VHF/UHF column for the magazine, which he has contributed continuously over the past 25 years.

The award follows on the Publications Committee giving him the Higginbotham Award (announced in the February issue).

Eric was voted to receive the award at the WIA's quarterly meeting on 4-5 February. It was given in recognition of his outstanding service to the amateur community and *Amateur Radio* magazine through contributing his column on happenings in the VHF/UHF world over the past quarter century.

Congratulations, Eric!

WIA News

WIA Negotiations Over Licence Fees

At the WIA Federal meeting over the weekend of 4-5 February, the WIA spent more than eight hours deliberating over the Spectrum Management Agency's proposed fees structure for amateur ratio licences, announced last December.

Letters to the Institute, submissions from the state Divisions and individual amateurs, and comments circulated on packet radio were all considered.

From all this, the WIA has developed a position and a strategy with which to negotiate with the Spectrum Management Agency (SMA). WIA President, Neil Penfold VK6NE, wrote to the Spectrum Manager Christine Goode in January, seeking a meeting to discuss the licence fees issue. Christine Goode replied, foreshadowing a meeting, and the Institute is expecting to meet with the SMA during February or March.

The date for introduction of the SMA's new fees regime has been put back till April. The Institute would like to thank all those who sent submissions or wrote and made their feelings and ideas known — it has helped tremendously in the process of formulating a response to the SMA.

Changes at WIA Federal

Replacing Bill Wardrop VK5AWM on the WIA Federal Council and Executive is Bob Allen VK5BJA, who took up his appointment at the quarterly convention of 4-5 February.

Bill Wardrop resigned last December.

The South Australian Division's new alternate Federal Councillor is Grant Willis VK5ZWI.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1995 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Rob Apathy Len Jones Don Hume	VK1KRA VK1NLJ VK1DH	3.570 MHz LSB, 146.950 MHz FM, 438.525 MHz FM each Monday evening (except the fourth Monday) commencing at 8.00 pm. Repeated on Wednesday evening at 8.00 pm on 146.950 MHz FM.	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Michael Corbin Pixie Chapple Peter Kloppenburg Mon-Fri 11.00-14.00 Mon 1900-2100)	VK2PFQ VK2KPC VK2CPK	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 52.120, 52,525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. Voicemail highlights on (02) 724 8793. The broadcast text is available on packet.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3XLZ	1.840MHz AM, 3.615 LSB, 7.085 LSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 146.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	 Lance Bickford Rodger Bingham	 VK4ZAZ VK4HD	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz. 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555, 7065, 10125, 146.700, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 434 3283	President Secretary Treasurer	Cliff Bastin Ray Spargo Bruce Hedland-Thomas	VK6LZ VK6RR VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 148 Derwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Secretary Treasurer	Andrew Dixon Ted Beard Phil Harbeck	VK7GL VK7EB VK7PU	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$69.00 $55.65 $40.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
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Three-year membership available to (F) (G) (X) grades at fee x 3 times.

■ Filters

An Adjustable Audio Filter System for the Receiver

Lloyd Butler VK5BR shows us how to shape the audio response at top and bottom and in the middle too! And it's all adjustable!*

Front panel view of the receiver filter unit.

Introduction

A circuit is presented which provides frequency response adjustment of the audio signal fed from the receiver into the loud speaker. Low frequency and high frequency cut off can be individually set over the speech range by adjustable high and low pass filters respectively. An additional adjustable notch filter allows an unwanted carrier beat note to be rejected from the audio pass band. The high and low pass filters can also be switched to track so that they provide a narrow bandpass at any centre frequency in the speech range thus providing a suitable response for CW or other narrow band modes.

Response is controlled by three switched capacitor filters coupled from three clocks, the frequencies of which determine the setting of cut off frequencies and the notch frequency. The clock frequencies (and hence the filter characteristics) are manually set by three panel mounted potentiometers.

The unit input is plugged into the receiver (or transceiver) headphone jack (thus disconnecting the internal speaker). A power amplifier at the output of the unit feeds the processed signal to an external speaker. Internal DC power supplies are fitted so that the unit can be powered from the 240 V AC mains.

Filter Nomenclature

As this article is essentially about filters, a few paragraphs introducing the terminology used in filters might be useful for some readers. Filters are used to restrict the band of frequencies which pass through them. Lowpass filters restrict frequencies above a defined cut off point. Highpass filters restrict frequencies below a defined cut off point. Bandpass filters restrict frequencies outside defined band limits and can be made up by combining highpass and lowpass pairs. The cutoff frequency of a filter is normally defined as the point at which the signal level falls by 3 dB (or 0.707) of the nominal level within the passband. Another type of filter is a band reject (or notch) filter which accepts all frequencies except those in a defined (and usually narrow) band.

Some important filter characteristics are the steepness of the response curve slope in the transition from passband to stopband and the general stopband attenuation. Other important characteristics are the consistency of level within the passband (referred to as passband ripple) and linearity of phase response (important in some types of signal such as video). Particular characteristics are well defined by filter designs such as the Bessel, Butterworth, Chebyshev and Elliptic. The choice of these depends on which of the characteristics are most important. For example, the Butterworth might be chosen for low ripple in the passband. On the other hand, the Chebychev has a steeper slope from the cut off point and greater out of band rejection but at the expense of some ripple in the passband.

Filters are classified as passive or active, the latter made up around amplifier elements. Classical passive filters such as the Butterworth and Chebychev are made up with series and shunt elements of capacitive and inductive reactance. Figure 1 shows typical lowpass filters which can be either Butterworth or Chebychev depending on the actual reactive values chosen. As shown in the diagram, the filter can be either unbalanced or balanced to suit the circuit to which it is attached. When the filter is balanced the values of inductance are shared between the two balanced legs.

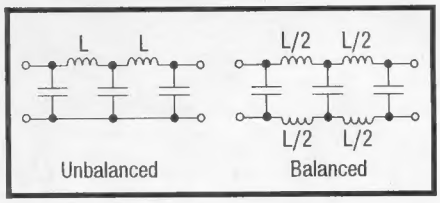

Figure 1 — Typical passive lowpass filters.

Selection of the reactive elements is also determined by the source resistance feeding the filter and the load resistance at its output. When

the source resistance is equal to the load resistance, the filter is defined as symmetrical. When these are unequal, the filter is defined as asymmetrical.

Apart from the type of filter (eg Butterworth, Chebychev, etc) the slope and out of band attenuation are dependent on the number of reactive elements in the filter and this number is often called the filter order. For a Butterworth filter, the slope is 6 dB per octave multiplied by the filter order. (NB. An octave is an increase to twice the frequency). For a Chebychev filter, the slope is much steeper. In deciding on a filter design, the filter order for a given filter type is chosen to achieve the desired out of band performance.

At low frequencies, and in particular at audio frequencies, the values of inductance required for passive filters necessitate the use of large and expensive inductor components. For low frequencies, most designers prefer to use active filters with operational amplifiers around which characteristics such as the Butterworth and Chebychev can be configured with resistive and capacitive elements. Active filters are used at frequencies up to around 100 kHz. Above this, circuit stability can be a problem.

Switched Capacitor Filters

In general, filters are not adjustable because their frequency determining elements are fixed. One filter which is often made adjustable is the State Variable filter. This has a second order Butterworth characteristic with the feature that lowpass, highpass, bandpass and notch outputs can each be taken out from selected points in the circuit. There are two resistors in the circuit which are of equal value and which determine the cut off frequency. To make this frequency adjustable, these resistors are replaced with a two gang potentiometer.

If a given voltage is applied to a resistance, a current flows as determined by the value of resistance in accordance with Ohm's Law. This can be seen to be simulated by charging and discharging a capacitor from the same voltage at a rate such that the average current is equal to that which flows through the resistor. By varying the switching frequency of charge and discharge so that the average current is varied, the associated circuitry is made to think that it is seeing a resistance varied. The switched capacitor filter is based on the State Variable filter except that the controlled variable resistance is replaced by the switched capacitor controlled from a clock operating at frequencies many times the cut off frequency of the filter. When the clock frequency is varied, the average current into the capacitor is varied making the circuit appear as though a resistance in the circuit were being varied. Hence adjustment of cut off frequency is achieved by varying the clock frequency.

The switched capacitor filters used in our filter unit are the National types MF6 and MF10. The MF6 is configured as a 6th order Butterworth lowpass circuit with its own internal clock operating at 50 times the cut off frequency. It also has two spare

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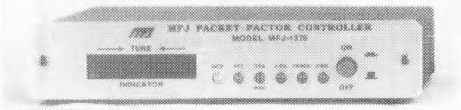

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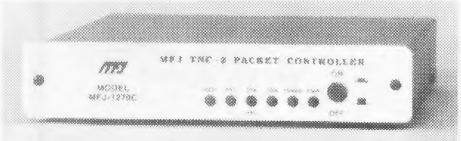

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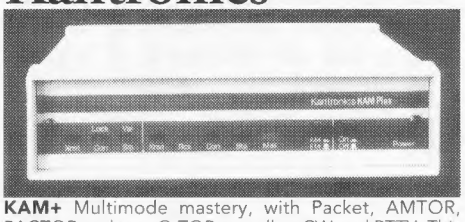

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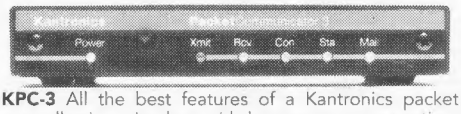

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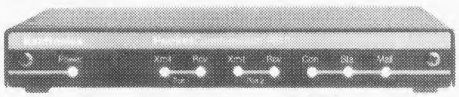

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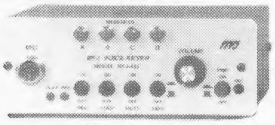
Kenwood Specials!

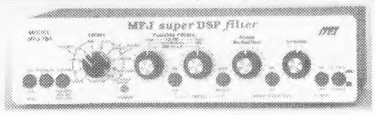
TS-450SAT HF with auto ATU	$2999	$2400
TS-690S HF with 6 metres	$2999	$2400

MFJ432 Voice Keyer



Let this new MFJ Voice Memory Keyer™ call CQ, send your call and do contest exchanges for you in your own natural voice! You can repeat a message continuously. It makes it so easy to call long CQs during poor band conditions.
MFJ432 Voice keyer **$219**

MFJ784 DSP signal processor



The MFJ super DSP Filter automatically eliminates heterodynes, reduces noise and interference simultaneously on SSB, AM, CW packet, AMTOR, PACTOR, RTTY, SSTV, WEFAX and FAX as well as weak signal EME and VHF signals.
MFJ784 DSP signal processor **$499**

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operational amplifiers on board the package which have been put to good use in our own filter unit. To operate the package, an external resistor and capacitor are required to set the clock frequency and then it is only a matter of connecting input, output and DC power (plus and minus 5 V).

Setting up the MF10 is not quite so simple. It is equivalent to two MF5 second order units, separate, but fitted in the one package so that a combined unit of 4th order can be achieved. It is a universal filter in that, by varying the values of external resistors and the external connections, it can be configured as highpass, lowpass, bandpass, or notch, with different characteristics such as Bessel, Butterworth, or Chebychev. To work out the desired circuit arrangement, one has to carefully study all the published application notes. The MF10 requires an external clock source at a frequency selectable either 50 or 100 times the cut off frequency. In our application, two MF10 packages are used, each driven from a 555 package operating as a clock at 50 times the frequency.

Circuit Description

Figure 2 shows the filter system in block form. Detail of the complete circuit is shown in figure 3. Input level from the receiver is assumed to be that which would appear across the receiver loudspeaker voice coil. Pre-amplifier N1 has a voltage gain of 5. This allows some margin for input level adjustment using potentiometer RV1 and sets the signal to a more comfortable level for the switched capacitor filters. As discussed further on, there is a signal to noise ratio problem if they are operated at too low a level.

Signal components fed into the inputs of the switched capacitor filters near clock frequency cause spurious signals at the filter outputs. These components must be stopped from reaching the filter inputs and this is mainly achieved by band limiting in the IF stage of the receiver and by limits in the audio response of the receiver. As a further precaution, stage N2 is configured as a second order Butterworth low pass filter with its cut off frequency just above 3 kHz which is the upper frequency limit of the complete unit. This is referred to as an anti-alias pre-filter. Operational amplifiers N1 and N2 are type μA741. Type μA747 combines two 741s in one package and alternatively this could have been used. However, there are many components around N2 forming the filter and the separate packages relieve the component congestion.

The first controlled filter in the chain is N3 (type MF10) which is configured as a 4th order Chebychev highpass stage. The Chebychev characteristic was chosen as its 4th order cut off slope is a close complement to the 6th order Butterworth slope of the associated lowpass filter N7 (type MF6). This choice was made accepting that there would be a few dB of passband ripple hardly noticeable to the ear. Operating as an individual highpass element, the filter is fed with a clock signal from N4 (type 555) which is adjustable using potentiometer RV2 over a frequency range of 5.6 to 60 kHz . Dividing by 50, this provides a highpass cut off adjustment range of 112 to 1200 Hz.

With the Notch circuit switched out, the highpass output is directly coupled into the input of lowpass filter N7 (type MF6). The internal clock of N7 is adjustable using potentiometer RV4 over the frequency range of 8.5 to 150 kHz. Dividing by 50, this provides a lowpass cut off adjustment range of 170 to 3000 Hz.

Operation of switch SW1 to the BP (bandpass) position disconnects highpass filter N3 from clock N4 and reconnects it to the output of the lowpass filter clock in N7. This allows the highpass cut off frequency of N3 to track the lowpass cut off frequency of N7 as adjusted by RV4. A narrow bandpass is formed which can be set by RV4 over the centre frequency range of 17 to 3000 Hz. At 1000 Hz centre frequency, the 3 dB bandwidth is around 200 Hz.

Filter N5 (type MF10) is configured as a 4th order Butterworth notch. In this configuration, an additional external operational amplifier is needed and use is made of one of the spare amplifiers in the N7 (MF6) package (refer N7B in figure 2). The filter is fed with clock signal from N6

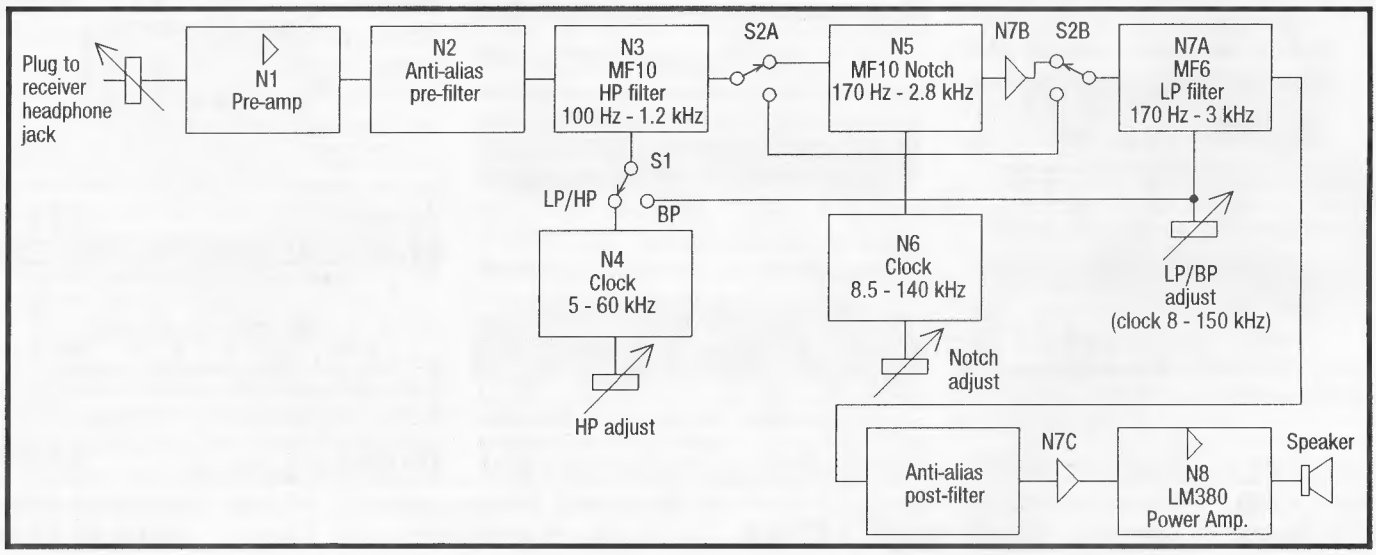


Figure 2 — Audio filter unit — Block diagram.

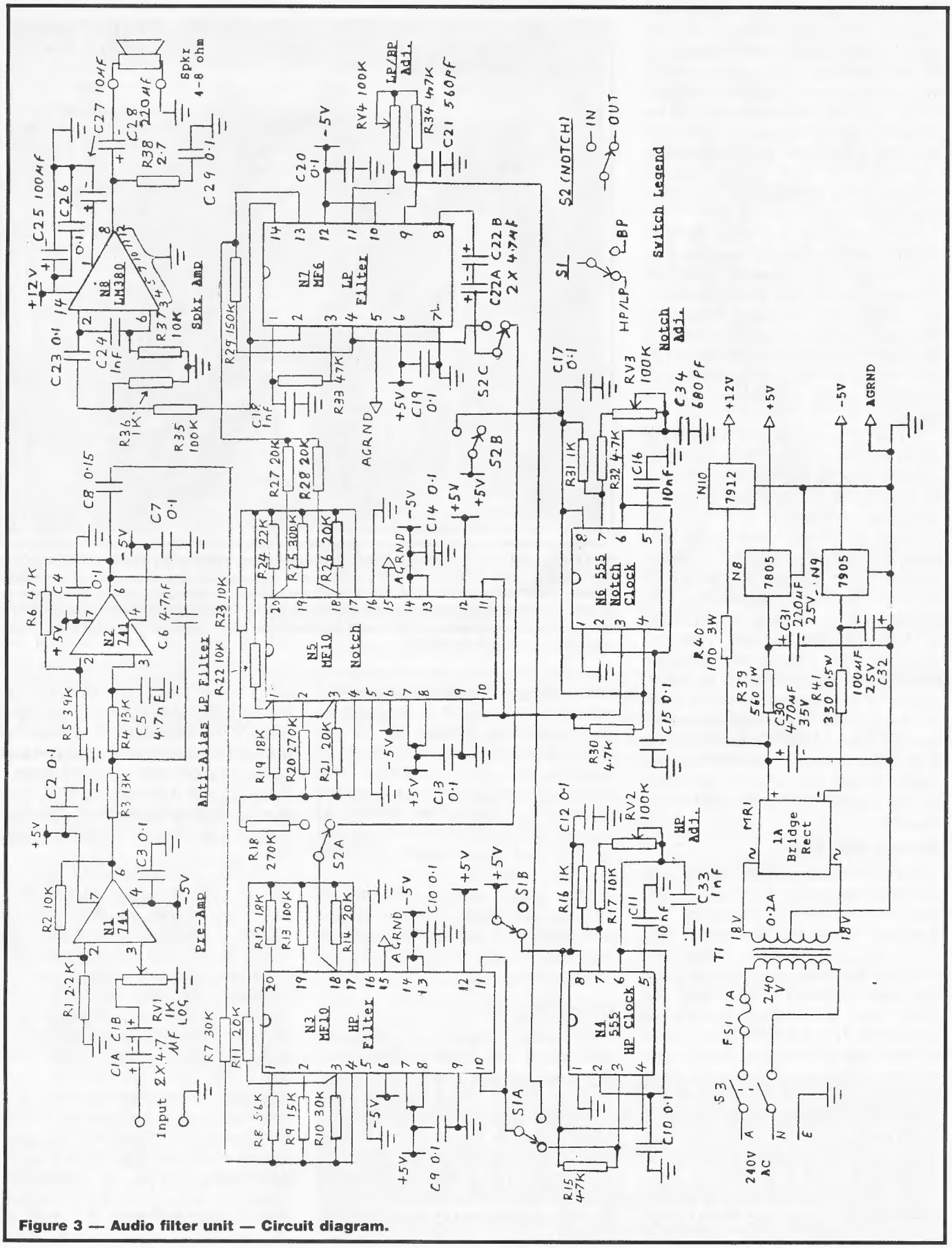
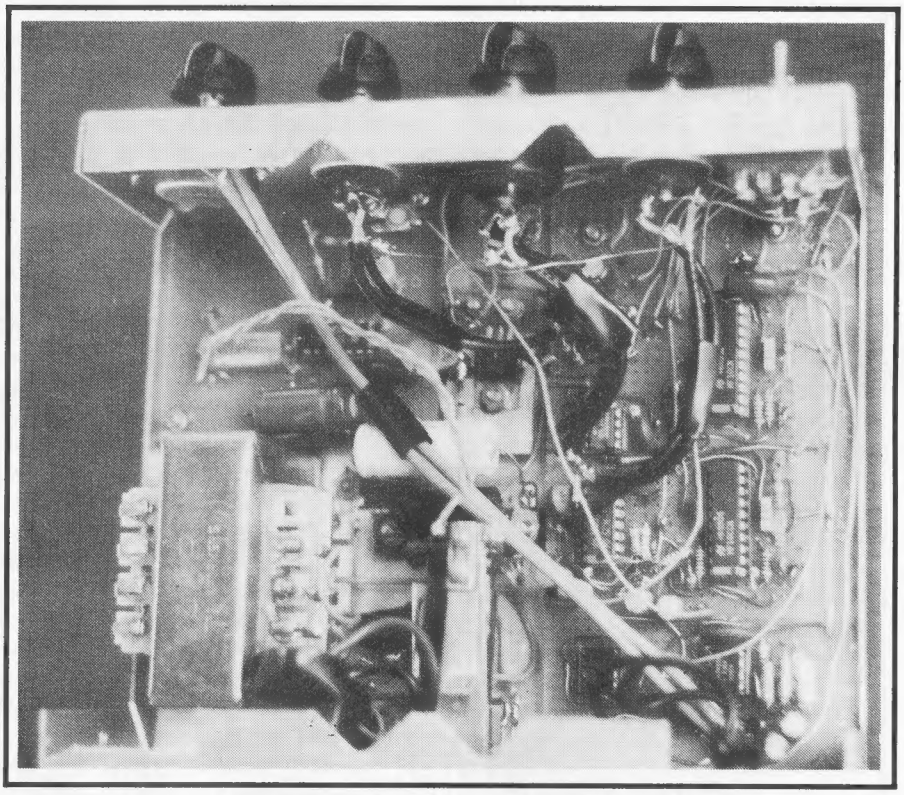


Figure 3 — Audio filter unit — Circuit diagram.

(type 555) which is adjustable over the frequency range of 8.5 to 140 kHz using potentiometer RV3. Dividing by 50, this provides adjustment to move the notch over the frequency range of 170 to 2000 Hz. With the notch set for 1000 Hz centre frequency, the notch width for 3 dB down is approximately 100 Hz. At the notch centre frequency, its attenuation has been measured to be near 35 dB.

The output of the filter system, taken from the output of lowpass filter N7, contains components at clock frequency which are easily removed by a simple RC anti-alias filter. This filter is formed by the two components R33 and C18 which are interfaced by the second spare operational amplifier in N7 (shown as N7C in figure 2).

If use of headphones were only required, the output of N7C could be coupled directly into the headphones. To operate a loudspeaker, a power amplifier is needed and for this purpose an LM380 (device N8) has been utilised. The LM380 package has quite high voltage gain, too much for our particular application. To correct for this, the input of the LM380 is fed via attenuation network R35-R36. The LM380 was selected because it happened to be on hand. Any other audio power amplifier such as the LM386 would substitute. To heat sink the LM380, it was fitted on a 60 mm square piece of copper plated circuit board with heat sink pins 3, 4, 5, 10, 11, 12 soldered to the copper.



The filter with the cover removed. As Lloyd says, *"The inside of the filter unit is not quite a thing of beauty. It has been put together as an experimental gadget which, of course, suffered quite a few alterations in the process of getting it to work. As assembled, it is not meant to be a prototype for reproduction. It is left to the reader to work out his own mechanics if he wishes to make use of the circuitry I have described."*

Power Supply

Recommended power rails for the switched capacitor filters are +5 V and −5 V relative to ground or +10 V relative to ground. The former split 5 V rail arrangement simplifies coupling between packages and this has been adopted to feed both the filters and associated operational amplifiers. The +5 V rail is also used to feed the 555 clocks which then deliver a nominal 5 V square wave output which is compatible with the clock signal specification for the switched capacitor filters. The load current on the +5 V rail is 31 mA and on the −5 V rail is 21 mA.

The LM380 power amplifier operates in class AB with large variation of load current with signal level change. To prevent interaction with filter circuitry, it is desirable to use a separate power rail for the power amplifier and a 12 V rail is derived for this purpose. The quiescent load current for the LM380 is around 7 mA. This swings to around 70 mA with normal signal and to 100 mA for power amplifier overload condition.

The power supply circuitry is included in figure 3. This utilises straightforward rectifier and voltage regulator circuitry requiring no further explanation.

Clock Noise

The clock frequency is normally well above the speech frequency range and running one or more filters from a single clock (as for the bandpass switch setting) creates no noise problems. However, more than one clock running at different frequencies (when in the LP/HP or Notch switch settings) can produce beat frequencies which may fall in the speech range. In the unit constructed, such noise was measured as less than 50 dB below the overload signal level of the filter system. To achieve the best signal to noise ratio, the gain of pre-amp N1 and the attenuation in R35-R36 are arranged so that, for a comfortable speaker level, the filter system operates just below overload level.

On the unit constructed, the 555 clocks were mounted on the same card and close to the switched capacitor filters. Tests indicated that some of the clock beat noise was induced directly from the 555 packages. The earth and +5 V rails to the 555 packages were isolated from the remainder of the system but a better result might have been achieved had the clocks been mounted on a separate card with improved supply decoupling. Another precaution taken has been to turn off clocks which are not needed for the particular mode of operation. Referring to figure 3, it can be seen that mode switches S1 and S2 incorporate contacts which, when

appropriate, disconnect 5 V from their associated 555 clock. Each of the switched capacitor filters has a separate analogue ground (marked AGRND) separate from their digital ground. These are taken via a separate common rail to the ground point, desirably with other analogue returns such as those associated with pre-amp N1 and anti-alias filter N2.

The clock beat noise is normally well masked by the signal level but, if the signal is turned off, the noise at low level is apparent to the ear for certain settings of filter adjustment.

RF Pick-Up

The whole filter system involves a multitude of high gain amplifiers which, in the presence of a high intensity RF field, are likely to pickup and rectify the RF signal. With the constructed unit turned on and the home transmitter operated, RF feedback was apparent even with the filter input disconnected from the transceiver headphone socket. Insertion of RF chokes and bypass capacitors at various points in the filter system failed to eliminate the feedback. It seems that, for operation in conjunction with a transceiver, the filter system must be disabled by relay switching when transmitting. A muting relay has not been included in figure 3 but it must be considered as an addition possibly needed.

Operation

Adjustment of the filter settings enables the bandwidth to be set at the minimum required to interpret the received signal whilst eliminating noise existent on unwanted sections of the audio band. On speech it is really a compromise on what seems best. A narrower speech band reduces the noise but it also reduces the speech intelligibility, particularly when the higher frequencies are cut too far. Cutting the low frequencies makes the voice sound thin but this seems to affect the intelligibility to a lesser extent. For narrow bandwidth signals of only a few hundred hertz (such as CW and RTTY), it is simpler to use the bandpass mode where the lowpass and highpass filters track in a narrow band state.

The notch is very sharp and the adjustment potentiometer must be moved very carefully to settle it on an unwanted carrier signal. It is very easy to move too fast and miss picking up the cancelling which occurs when passing across the signal. Some potentiometers have sloppy bearings which produce backlash and this makes setting the notch difficult. Several different potentiometers were tried out in the unit constructed before a satisfactory one was found. At one stage a 10 turn potentiometer was used and this made fine adjustment much easier. However, winding the knob around and around many times searching for the cancellation became a little tedious.

Cancelling out an unwanted CW signal can be a little tricky. It is very easy to pass the notch through the CW signal frequency in a key up period between Morse characters and miss detecting the cancellation. Whilst the notch handles stable carrier signals and CW signals it is too narrow to cancel out wider bandwidth frequency shift signals such as packet. A further improvement to the system might be an adjustable bandwidth notch which could be set to reject a wider band signal. Perhaps we can work on that.

Switching in the notch on speech to remove a nuisance carrier beat tone has no detrimental effect on the speech quality. The tiny section of the speech band which is sliced out is not apparent to the ear.

The unit as constructed has been assembled on an experimental basis using components which were on hand. No work has been done to locate a recent source of supply of the National MF6 and MF10 packages or other makes of switched capacitor filter. The other ICs and regulator packages used are readily available.

The unit as assembled works quite well. There could be room for improvement in reducing further the level of clock sourced noise by fitting the clocks on a separate card away from the filters and carefully decoupling the rails. Simple anti-alias filters between each of the switched capacitor filters might help further. However, these were tried out on the assembled unit and, as no noise reduction was noticeable, they were not included in the final circuit. As suggested earlier in the text, an adjustable width notch would be a useful addition worthy of further thought.

*18 Ottawa Avenue, Panorama SA 5041

RT

Complete Unit Specification

Lowpass	Cut off — 170 to 3000 Hz adjustable
	Slope — 6th order Butterworth
Highpass	Cut off — 112 to 1200 Hz adjustable
	Slope — 4th order Chebychev
Bandpass	Centre frequency — 170 to 3000 Hz adjustable
	3 dB bandwidth — 200 Hz
Notch	Centre frequency — 170 to 2850 Hz adjustable
	Width at 3 dB down — 100 Hz (measured at 1 kHz)
	Attenuation at centre frequency — 35 dB

Maximum frequency range for 3 dB down — 170 to 3000 Hz
Input Resistance — 1000 ohms
Recommended load impedance — 4 to 8 ohms
Maximum output power — 400 mW into 4 ohms (Limited by overload level of filters. Power can be increased if needed by reducing R35)
Maximum voltage gain (input to output) — 10
Noise level below maximum power output — 50 dB
Power supply — 240 VAC 30 mA

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

■ Technical

A 240 Volt AC Line Monitor

Ken Taylor VK3KAV describes how to construct a useful metering device.*

WARNING

The unit described here operates directly from the AC mains. It has no protective isolation such as a transformer. All parts of the circuit must be assumed to be operating at mains potential, even with the unit switched off. This can happen if the active and neutral leads are reversed, an all too frequent occurrence.

The author recommends using a fully insulated chassis for this project with good reason. A metal (or uninsulated) chassis is not recommended. If it is used then a protective earth wire connected to the chassis is mandatory, ie three core flex. Also, the integrity of the protective earth must be established before power is connected. This is particularly important with generators. Checking household wiring may only be carried out by a licensed electrician.

All circuitry in an operational unit must be fully enclosed and not accessible. This includes using probes.

During calibration use insulated screwdrivers when adjusting the trimpots. Even the shaft should be insulated. The operator should use insulated clothing, eg gloves, and never assume that the insulation works. Take care!

REMEMBER, 240 V AC MAINS ARE LETHAL!!

Here is a simple gadget that will be very useful in WICEN exercises, John Moyle field days and to farmers or builders. In fact, any place where portable AC alternators are used. This gadget is even handy in the shack to keep an eye on mains voltage and frequency.

Description

Both meters used in this gadget are 1 mA FSD which may be available from the junk box, or readily from suppliers such as Dick Smith Electronics, etc.

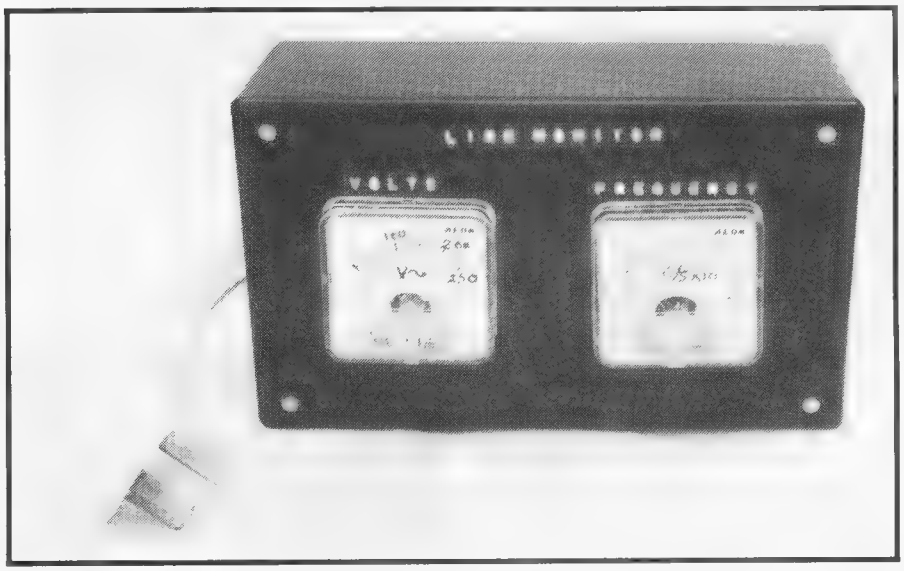
The voltage indicating meter is supplied via a bridge rectifier from the AC input, then through a 390 k resistor and a 50 k trimpot.

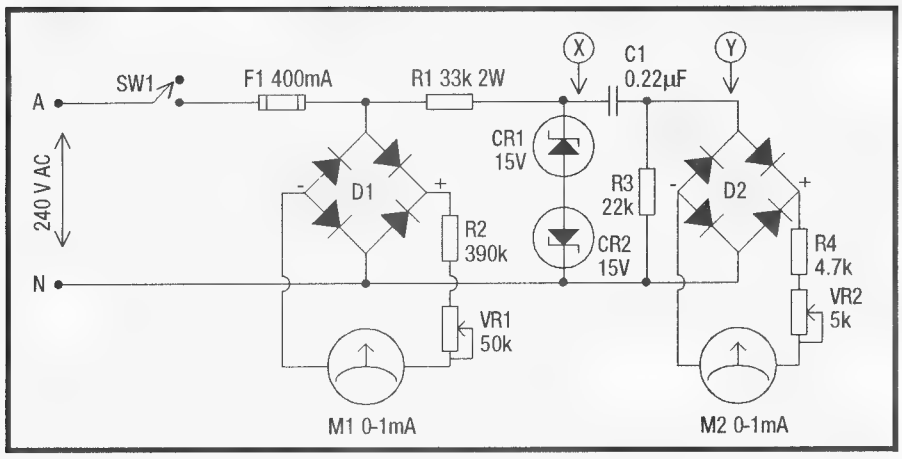
The frequency indicating portion uses a pulse counting detector, the output of which is supplied to the other meter via a 4.7 k resistor and a 5 k trimpot. The frequency indication shows little reaction to voltages above approximately one hundred volts.

The circuit diagram of the complete unit shows the meter, M1, with its associated circuitry connected across the line, metering the voltage. The frequency measuring part of the circuit starts at CR1 and CR2, each a 15 Volt zener diode connected back to back. During the peak of the cycle of the line voltage wave form, one diode is forward biased and so conducts. At the same time the other diode, through its avalanche operation, will conduct current in the same direction but will regulate the voltage at its rated value of 15 volts. R1 is the voltage dropping resistor. It requires a 33 k resistor with a rating of two watts.

Such a resistor with this rating is fairly hard to come by these days. I paralleled two 68 k one watt resistors. These resistors do get quite hot if the unit is left on for an appreciable time. On a second unit constructed I used four 150 k one watt resistors in parallel. This resulted in much lower temperatures when left switched on for an extended period of time. As the total resistance was within 15% of the circuit value, no appreciable difference was noted in the operation of the unit.

As the polarity of the line voltage reverses so does the action of the two diodes, and 15 volts is developed across the pair in opposite polarity. The resultant voltage at point X is almost a square wave. Its frequency is the same as that of the line input, with an amplitude of 30 volts peak to peak. C1 and R3 differentiate this signal forming positive and negative pulses at point Y. These pulses are rectified by another bridge rectifier and connected by R4 and VR2 to the meter. VR2 is used to calibrate M2. With an increase in frequency the number of rectified pulses per second





increases, causing M2 to read higher. A lower frequency has the opposite effect, with M2 reading lower.

Construction

A printed circuit board could be made to mount the various components. However, as there are not a great number of components required, it can be built on a piece of resistor mounting strip (Dick Smith Electronics, H6610). Even tag strips could be used.

The complete unit was housed in a plastic Zippy box with the meters being mounted on the lid. A plastic box was preferred so that if 240 volts comes in contact with the case it is unlikely to cause injury.

The dimensions of the Zippy box used are approximately 50x90x150 mm. No particular layout of the components is required. **Remember that you are working with voltages that can be lethal.** Use safe construction practices, and take care when calibrating the gadget. The milliamp meter used as the voltmeter could have the figures 0-1 carefully removed or painted over, without touching the calibrated scale, and new figures in a scale 0-250 marked in at appropriate places, 250 being full scale deflection. The frequency indicating meter could have the word milliamperes removed together with the decimal points before the figures and Hz (or C/s if you prefer) X 10 marked on it.

Calibration and Use

When completed and ready to be adjusted check it over for shorts or unnecessary long ends of components that could cause unsatisfactory results. When all is OK, connect to mains power. With a volt meter of known accuracy, switch on, and adjust VR1 so that M1 indicates a voltage reading corresponding to that of the calibrating meter. Then adjust VR2 so that M2 reads 5 on the scale.

That completes the setting up and adjusting. Switch off and carefully install it in its box. When assembled verify that the calibrations have not altered. If a motor powered alternator is available, connect the unit to it and vary the speed slightly, noting the rate of change on the meters. With M2 calibrated as previously indicated, slowing the motor down so that the motor reads 4 on the scale indicates the frequency is 40 Hz. Speeding the motor up so that the meter reads 6 on the scale indicates that the frequency is 60 Hz.

Having an instrument of this nature in use at the next exercise or field day you will know whether or not your alternator is putting out the correct voltage and frequency for your gear.

I can make no claim to the design of this gadget as I came across a similar device in an ARRL publication several years ago. I have, however, changed some of the component values and added additional components so that satisfactory operation can be expected with Australian voltages and the component values available at the time of construction.

Parts List

SW1 SPST toggle switch
F1 5AG 400 mA Fuse with holder
R1 33 k 2 W resistor
R2 390 k
R3 22 k
R4 4.7 k
VR1 50 k trimpot
VR2 5 k trimpot
M1 0-1 milliampere meter
M2 0-1 milliampere meter
CR1 15 volt Zener diode
CR2 15 volt Zener diode
D1 4x1N4004 Diodes
D2 4x1N4002 Diodes
C1 0.22 µF 100 VW capacitor
Zippy box (50x90x150 mm)

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■ Technical

An L of a Network — Part 1

Graham Thornton VK3IY describes all you wanted to know about the L-Match, but were afraid to ask!*

Introduction

The simplest solution to the problem of transforming a complex load impedance into a pure resistance is an L network. It consists of just two components, a variable capacitor and an adjustable inductor. Since load resistance and load reactance are independent variables, it is not possible to have any practical ATU with less than two adjustments. The L-Match may be seen as the progenitor of all other ATUs. Correctly applied, it can deal with a wide range of impedances; this may come as a surprise, considering its simplicity. It is particularly useful for unbalanced loads such as random wires, yacht backstays and mobile whips.

The design, if done from first principles, involves quite a lot of mathematical manipulation which, at best, is tedious and, for some amateurs, utterly forbidding. This article seeks to simplify matters by using a graphical approach. After all, we are designing an adjustable device and high precision is not justified. Ball park answers are all we need. The same approach is used to investigate operating Q, insertion loss and the peak voltage developed across the capacitor. As we shall see, each load problem has at least two solutions; sometimes four. The following treatment is offered as a design tool for L networks. For completeness, the mathematical basis is stated, so that those who are able may critically evaluate the information, and that the super-keen may write a computer program, if that is the preferred option. However, it is not necessary to understand the mathematics; if the given procedure is followed by rote, a workable solution will be obtained, provided only that the given reactances can be achieved in practice.

The operating principle of an L-Match is very simple. As illustrated in Figure 1, it is a four-terminal network. One pair of terminals connects to a parallel tuned circuit, and thus presents a high impedance. The other pair "sees" a series resonant circuit and is therefore of low impedance (it took me a good forty years to wake up to that simple explanation, but then I'm a slow learner!). It can be used either way round as a step-up or step-down transformer. Load reactance can be considered as part of the output reactor, in most cases.

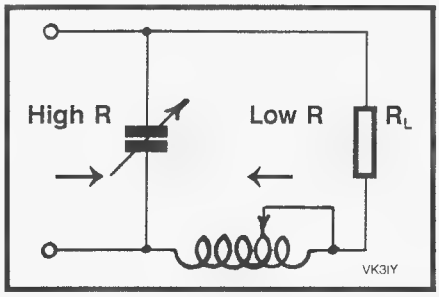

Fig 1 — L Network in step-down mode.

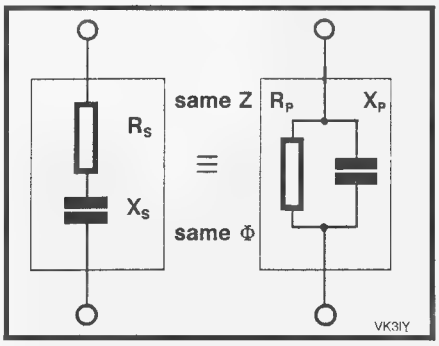

Fig 2 — Equivalent series and parallel impedances pictured in externally indistinguishable black boxes. Knowledge of the contents of one box allows the components for the other to be determined.

Theory

There are two discrete cases to be dealt with. One is where the resistive component of the load impedance is less than the desired input resistance, the other being the converse. (Note that this applies to resistance, not scalar impedance!) The theory is invalid in the special case where the two resistances are equal but, in that case, an ATU is not needed!

Central to the analysis and application of the L network is the concept of equivalent series and parallel impedances. A little chat about this would be appropriate for starters. Any reactance in series with a resistance may be represented by another (different) resistance in parallel with another reactance of the same sign, and vice-versa. The criteria for equivalence are that both circuits have the same impedances and phase angles. If we regard the two options as being enclosed in two-terminal black-boxes, their circuit behaviour would be identical, and we would have no way (in an AC sense) of distinguishing them. Both are equally valid representations of the same thing. This is illustrated in Figure 2. Most published information about antennas and transmission lines, by convention, is presented as series equivalent impedance. The formulas for conversion are:-

$$R_P = \frac{R_S^2 + X_S^2}{R_S}$$

$$X_P = \frac{R_S^2 + X_S^2}{X_S}$$

and conversely:

$$R_S = \frac{R_P . X_P^2}{R_P^2 + X_P^2}$$

$$X_S = \frac{X_P . R_P^2}{R_P^2 + X_P^2}$$

There is one interesting and highly relevant feature about the above equations. The equivalent resistance is partly **dependent on reactance.** Thus, adjustment of reactance can **transform** a resistance to a desired value.

The fundamental formula for an L network is:

$$R_{IN} \cdot R_{LOAD} = - X_1 \cdot X_2$$

This applies to both cases. This formula can best be remembered as "The product of the resistances is equal to the negative product of the reactances". Note that, since neither of the resistances can be negative, the two reactances must be of opposite sign to give a positive result. But it matters not which is which. It sometimes happens, if we are lucky, that the series equivalent load resistance is less than 50 Ω, and its parallel equivalent resistance is greater than 50 Ω, in which case the network can be used either way round. This gives a choice of four options which can be used.

The situation for low resistance output is shown in Figure 3. The upper practical circuit shows things

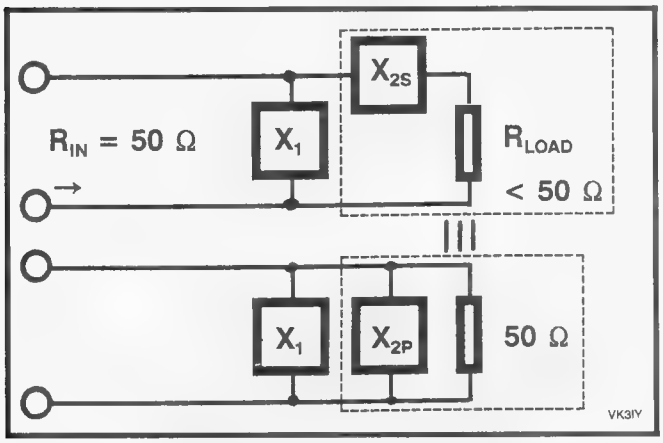

Fig 3 — Practical circuit (above) and parallel equivalent circuit for low resistance output case. Note that, for resonance, X_1 and X_{2P} must be conjugate reactors; ie same magnitude but opposite sign. If the concepts implicit in this diagram, and the following Fig 4, can be grasped, your understanding of the topic, and ATUs in general, will take a giant leap forward!

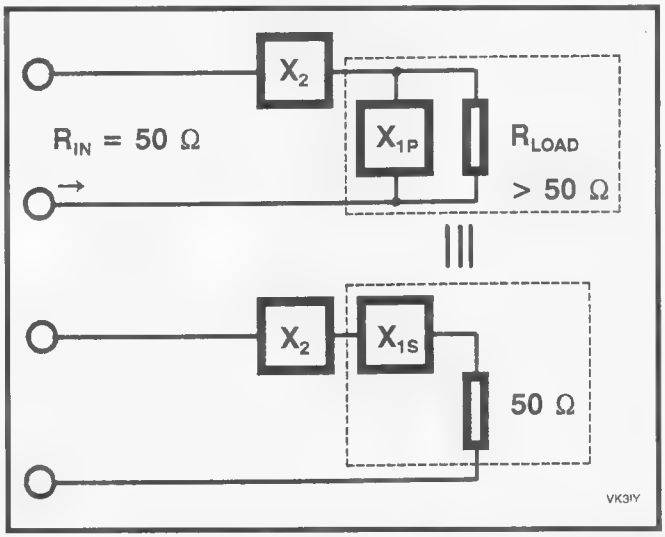

Fig 4 — Practical circuit (above) and series equivalent circuit for high resistance output case. Note that, for resonance, X_2 and X_{1S} must be conjugate reactors.

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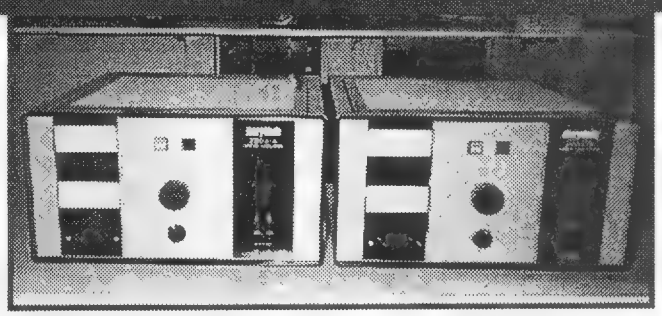

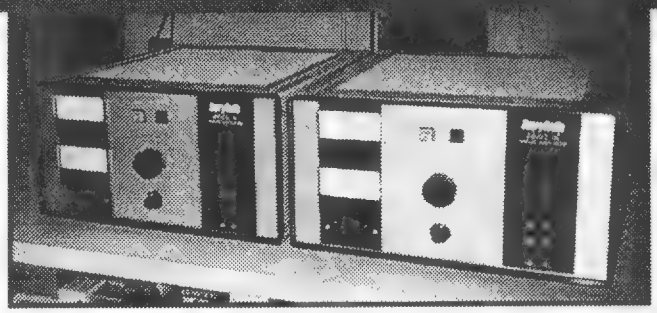

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as they appear, but the lower equivalent circuit shows how it really works. The sole task of the series output reactor (X_{2S}) is to be such a value that the parallel equivalent load resistance is equal to 50 Ω (or whatever other figure is desired). Thus it may be regarded as a LOADING reactor. For resonance, the value of the input shunt reactor (X_1) must be exactly equal and opposite to the equivalent parallel shunt reactance produced by the transformation process (X_{2P}). Thus the input reactor functions in a TUNING role. (It is tempting, looking at the practical circuit, to assume that the two reactances are equal in magnitude. This is NOT the case! For this to be so, R L & C must be either ALL in series or in parallel. The difference is illustrated in Figure 5.)

The high resistance output case, shown in Figure 4, works just the other way around. The output shunt reactor (X_{1P}) must be of such a value that the resultant equivalent series resistance is equal to 50 Ω. It too is a LOADING reactor. The series element (X_2) must provide a conjugate reactance for TUNING. (As a matter of interest, this is exactly the process by which the very popular Z-Match works.) In this case, the two reactive elements will be approximately equal in magnitude, if the load resistance is very much larger than 50 Ω.

Design Procedure

(i) Low Resistance Output

Well let's get down to the nitty-gritty of design. We will start with the low resistance output case, as it is much easier to deal with. A desired input resistance of 50 Ω is assumed throughout. We have seen how the value of the output series element controls everything else, so that would seem an appropriate place to start. The formula to determine its magnitude is:

$$|X_{SERIES}| = \sqrt{R_{LOAD} \cdot (50 - R_{LOAD})}\ \Omega$$

For convenience, this function is plotted in Figure 5. The only input information required is the series load resistance. Note that this gives the total series reactance, which includes any load reactance which we will subtract later on. For the present, let's keep our options open whether it is to be an inductor or a capacitor. It is interesting to note that the maximum series reactance under any condition is 25 Ω.

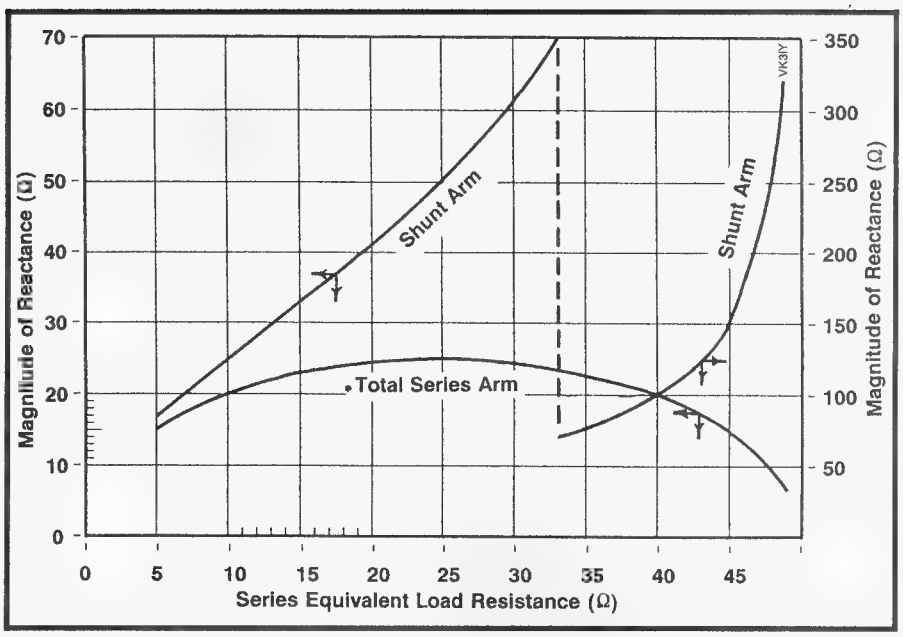

Fig 5 — Magnitude of network elements for low resistance output.

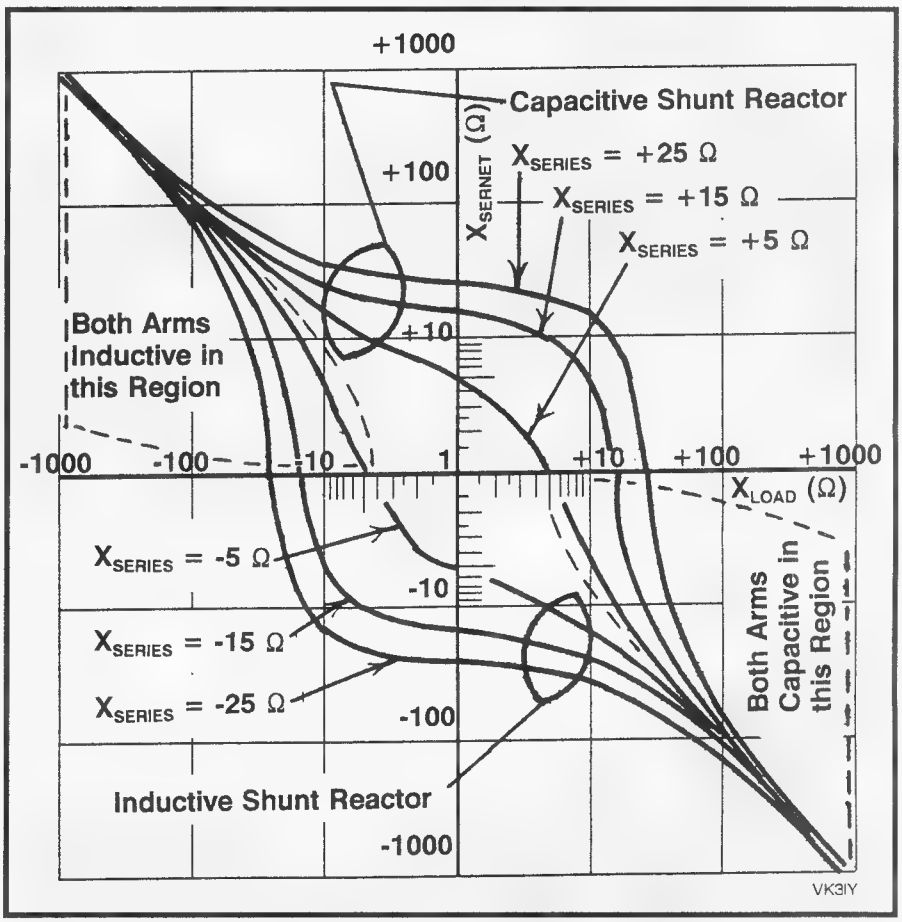

Fig 6 — Value of series reactor including load reactance compensation-low resistance output case.

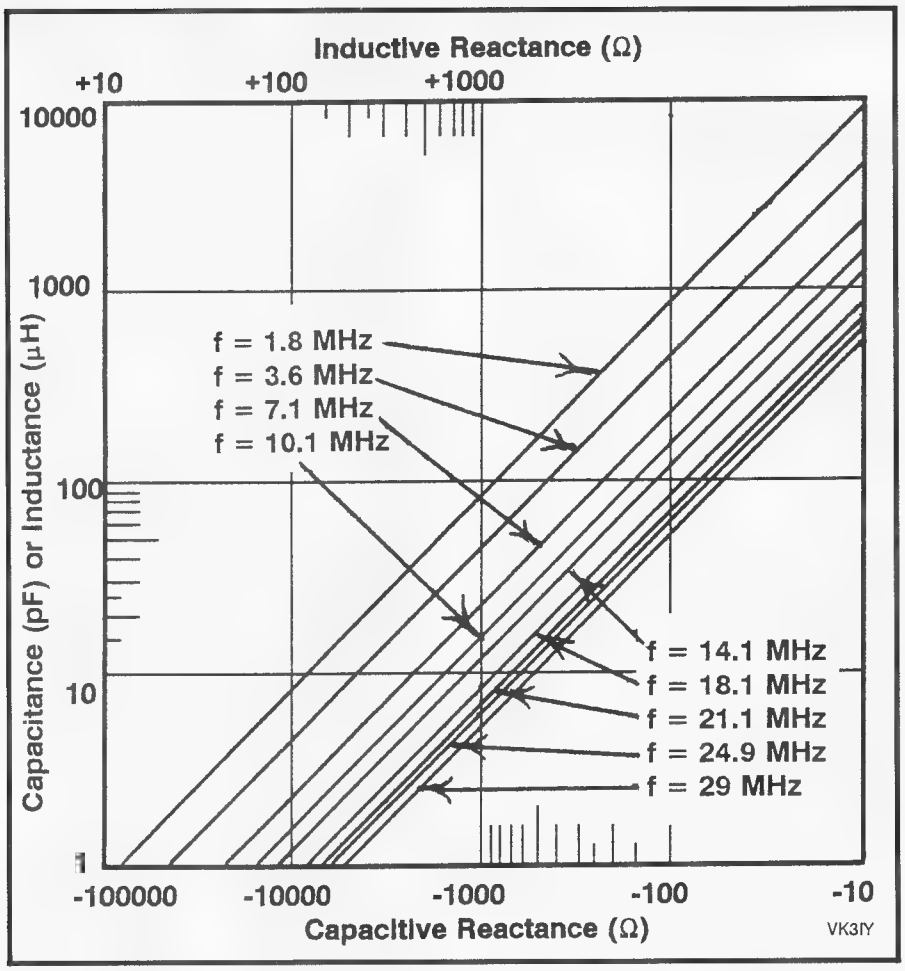

Fig 7 — Inductance and capacitance from reactance.

Well let's have the other half of the network. In this case, the final value is not affected by the load reactance. The relevant formula is:

$$|X_{SHUNT}| = 50.\sqrt{\frac{R_{LOAD}}{50 - R_{LOAD}}}\ \Omega$$

This expression is also plotted in Figure 5.

We have already found the total series reactance, but we need to subtract any load reactance from it to determine the value of the lumped reactance to use in the L network. The result will be different, depending on whether a shunt inductor or a shunt capacitor is used. It is worthwhile considering both options, as one may present a practical advantage over the other. X_{SERNET} represents the value of series reactance to be inserted:

$$X_{SERNET} = X_{SERIES} - X_{LOAD}\ \Omega$$

(Having regard for sign; ie positive for inductance, negative for capacitance.)

Thus, if the load is a pure resistance, X_{SERNET} will simply be the same as X_{SERIES}. Figure 6 may be used to determine X_{SERNET} for both positive and negative values of X_{SERIES}, taking X_{LOAD} into account. (An interesting situation arises if X_{SHUNT} is capacitive and X_{LOAD} is a larger inductive reactance than X_{SERIES}. Both arms of the L network would then be capacitors.)

When the load reactance is high, it is best to ignore Figure 6. In this case we have no option but to insert an opposite reactance as our series element. We may adjust it as either a capacitive or inductive reactance. However, since we are tuning for a small difference in a large reactance, resolution problems may occur; we may need a slow motion drive for a capacitor, or a series fine-tuning capacitor if the series arm is an inductor.

Reference can now be made to Figure 7 to translate the reactances obtained into practical values of inductance and capacitance. A choice can be made between the two options on the basis of availability of components, and other properties of the network which will be described later.

Next month, we'll take a look at the high resistance output case. See you then.

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■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**

Oh No, Not the Z-Match Again!

In the April 1994 issue of *Amateur Radio,* Murray VK5ZQ described some problems he had with the Z-match. To refresh your memory, he was using a Z-match with a built-in SWR meter, but stopped using it when he found the SWR meter in his transceiver disagreed with the SWR meter in his Z-match. He then began to think that the Z-match might not work after all. In a letter received in June 1994 he continued the story. (An extended absence from VK followed by that all too common problem, overload at work, prevented this Ron from following up as quickly as he should; apologies are extended to the other correspondents affected).

Murray wrote, *During May a local radio club devoted its monthly meeting to the Z-match. The meeting began with a 20 minute talk by a well respected technical researcher and amateur on the said device. During the last five minutes he briefly mentioned "cancelling the reactance of the load" that the Z-match was to feed into. If the audience's attention had wavered slightly, that point could easily have been missed,* ***but that was and is the very point of my argument!***

Later in the evening, when members were describing their efforts, another well qualified and respected amateur mentioned that his standard ARRL ATU would pass a greater current up the feedline than his Z-match. I wasn't surprised.

I connected a light globe to my Z-match and managed to light it up with an SWR of one. Then, to simulate a reactive load, ie an antenna ***system*** *that had not been brought to resonance, I added an inductor in series with the globe.*

Again the Z-match gave me an SWR of one, but now the globe shone with less brilliance. Less current was flowing!

I then added a variable capacitor to tune out the inductive reactance. Result, the lamp brilliance was restored!

Conclusion: The Z-match will nicely match impedance, but does not seem to tune out reactance, ie it won't tune the antenna ***system.*** *However, the "standard" ATU does tune the system and then proceeds to match the impedance as well.*

By the way, the disagreement between the SWR indicators was tracked down to a soldered joint that wasn't soldered properly. Now the indicators agree with each other.

Well, from Murray's concluding comments, perhaps his Z-match worked after all.

I do, however, take issue with his conclusion that the Z-match will tune out a reactance but not tune the antenna system. As has been demonstrated ad nauseam in *Amateur Radio,* the Z-match is no different from any ATU, matcher or tuner, whatever you may call it. They all work by "tuning out" the reactance seen at the shack end of the antenna feedline and also perform some transformation so that the resistive part of the impedance seen at the shack end of the feedline is close to the desired value of 50.0 ohms (or 75.0 or 300.0 ohms or whatever it is that you want). All of these tuners (or matchers, etc) have limitations in the range of reactance and resistance that they can cope with, the range varying from one band to the next.

By achieving a match at the shack end of the feeder, the antenna system has been tuned. This does not mean that the antenna itself has been brought to a half wave resonant length or that the feedline no longer has a high SWR. It means that system resonance has been achieved. The feeder and antenna combination become part of a resonant circuit when connected to the ATU reactance. The transceiver is tapped into the system at a nominal 50 ohms point (usually).

So why does a "standard" ATU apparently give "better" results than a Z-match? Well I don't know for sure. I don't even know what sort of circuit Murray defines as a "standard" ATU. The *ARRL* has published L, Pi, tapped coil and inductively coupled coil tuners, all of which could be called a "standard" tuner on the basis of being a tried and true circuit. The Z-match is also a tried and true circuit.

My guess is that the SWR is not a true 1:1 even when so indicated on Murray's meter. Thus he might have two different situations when the meter indicates zero reflected power. All SWR meters exhibit some finite lack of directivity. This means that some forward power is detected by the meter when it is measuring reverse power. The power may add or subtract from the reverse power, giving a higher or lower reading than should occur. "Murphy" is not a kind person and hence optimistic SWR readings are often obtained when such a result is the least desired one. Readings of less than 5% of full scale deflection could be obtained for at least two quite different "almost matched" conditions. I am not doubting what Murray observed, but cannot duplicate his experience and, apart from the above suggestion, cannot see any logical reason why the power delivered to an average load should be substantially different when different tuners are used or when low loss reactances are added to the load when matched conditions prevail.

I might also add that not all SWR meters are exactly 50 ohm devices, that is they may indicate zero reflected power truly only when inserted in a line of some value other than exactly 50 ohms. This may be a deliberate design feature or it may be a consequence of normal manufacturing tolerances, or even because of inadequate design in the first place. I have a VSWR meter which supposedly operates at either 50 or 75 ohms by a flick of a switch. A brief examination of the

construction and circuit shows this to be wishful thinking. Yet it is made by a respected Japanese instrument manufacturer. Buyer beware, I suppose.

On Bow Ties and Building Antennas Inside the Shack

It was only a matter of time before someone took up the issue of computer simulation of antenna systems. The "father" of most of the currently popular programs is the American program, Numeric Electromagnetic Code or NEC for short. This large computer program required a large computer to run it and so only the US military and large universities had the machines to use it. Then along came a version called MININEC, a mini version written in BASIC and capable of running on a PC. I bought a copy from the USA's National Information Service for $200 US (being a foreigner I paid twice what a US citizen would have paid). It worked but was clumsy to feed information to and it is not at all easy to interpret the output tables. Then several people wrote "front" and "tail" ends which made the system input-output more user friendly by including such features as polar diagrams of the pattern.

Nevertheless a degree of skill and knowledge is still required to avoid the old "garbage in, garbage out" situation.

Now over to David, VK1DT.

I read your article on the "bow tie" with interest.

*I have modelled your correspondent's design, using NEC81. The height of the end wires (not given) was adjusted to achieve resonance. I assumed the ground to be heavy clay. As the ground clearance is fair, this is not critical. The input impedance varies from 69 ohms (perfect earth) to 86 ohms (assumed earth). A 1/4 wave, 75 ohm line would transform (86/75) * 75 to (75/86) * 75 = 65 ohm.*

I decided on an inverted Vee of the same base area for gain comparison. There are a number of ways this could be fitted. I chose to remove the wire from 1/4 to 3/4 Lambda in the original design. This leaves an inverted Vee with bent ends. To achieve resonance the ends were trimmed.

There is practically no difference in the gain pattern of the two designs. The input impedance dropped from 86 to 33 ohms. The current on the loop is zero at 1/4 and 3/4 Lambda and has near sinusoidal distribution. The currents are mirror-imaged along the major axis of the base area. The loop could be considered a cross between a fan dipole and a folded dipole. The current splits evenly as per both the fan and folded dipole. The current in the end sections is too small to change the radiation pattern. I am using the term "dipole" loosely, regardless of apex angle.

For the loop to be considered a folded fan, the fan's impedance needs to be 86/4 = 21.5 ohms, about 2/3 of unfanned 33 ohms. Presto, another NEC run, 21 ohms. I feel there is material for an article, or six here; not the intention of this letter.

It would be interesting to compare the following for bandwidth, feed impedance, size and multiband potential.

- Dipole.+/– Bend (Inv Vee);
- Fan Dipole; (should fanned ends be joined?)
- Folded Fan Dipole; (wires not crossing at apex)

SOME THINGS HAVE NO COMPARISON

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- Folded Crossed Fan Dipole; (the original design)
I suspect any gain differences from your reference are due to differences in apex angle and ground clearance. It pays to be sceptical about modelling results. In this case the input impedance, current distribution and internal programs checks look good, better than average luck for me.

My interest in the loop is at frequencies far from resonance, but that's another story. I have enclosed hard copy of some the NEC results. I would be interested in any results or observations you or your readers may have.

David kindly supplied some six pages of tabular printout, which for reasons of space are not reproduced here.

David makes some good points when considering as to why there are differences between the results I obtained and those he gets.

There is no doubt that his results show less than 0.3 dB difference between the two antennas, namely the Bow Tie and the Inverted Vee. I note that David's Inverted Vee has bent ends, whereas the one I referred to did not. This would make a small difference to the pattern. There are two interesting aspects of the printouts provided.

Firstly there is some lack of symmetry in the azimuth pattern. If the antenna is physically symmetrical then I would expect the radiation pattern also to be symmetrical. Has anybody else noticed such behaviour in modelling programs?

Secondly, the signal at 10 degrees elevation is about 5.5 dB stronger when the aerial is modelled over a perfect conductor than when modelled over "heavy clay". I would have expected the reverse. Perhaps someone out there with more knowledge and experience might care to comment.

Well, perhaps this just shows that different computations of the same data give small but noticeable differences in the results.

That's all for this month.

So now its goodbye from him and goodbye from me.

*C/o PO Box 2175, Caulfield Junction, VIC 3161

WIA News

Olympics Callsign

For the year 2000 Olympics in Sydney, the WIA applied to the Spectrum Management Agency (SMA) for the special event callsign AX2000 (A-X-two thousand).

The SMA replied that they applied to the International Telecommunications Union (ITU) for permission to use the callsign, but they replied that the use of such a callsign is prohibited.

However, all is not lost — the WIA may use AX2OOO (A-X-two triple Oh) during the Sydney Olympic Games.

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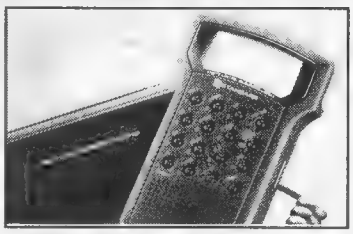

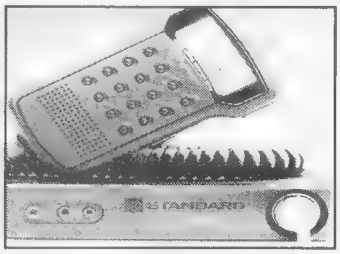

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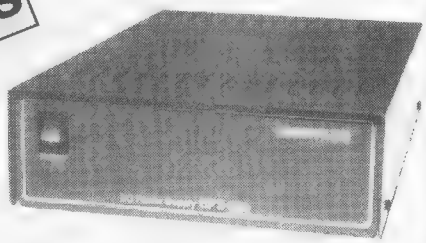

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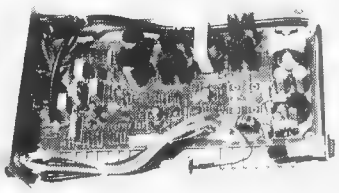

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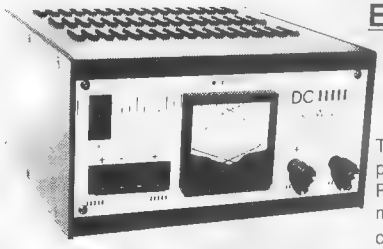

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■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

Smart Nicad Charger

A smart Nicad battery charger which automatically discharges the battery to a known state of discharge and then carries out a full charge cycle was described in *Radio Communications* for November 1994 by E R Gaze G8NKA. This sort of charger is very desirable if you are to reliably receive a full capacity from the Nicad pack in your radio. The circuit also offered the option of a fast one hour charge as well as a longer 12 hour charge cycle. The circuit also allowed an extended trickle charge to be maintained for a week or so.

The secret of all this is a purpose built Integrated Circuit Type U2400B. Unfortunately, the manufacturer was not specified but the type number is similar to that of a similar IC used to control the charging of Gel Cells and which is locally available. I would be interested to learn the manufacturer and any local source of the U2400B. The author of the article did, however, give a source of a basic kit from a UK supplier. Obtaining parts from the UK may be possible.

The UK parts supplier was JAB Electronic Components, 1180 Aldridge Rd, Great Bar Birmingham, B44 8PB, UK. The UK cost of a kit was 34.50 pounds sterling. An enquiry enclosing an SASE with means of return postage may elicit costs of key components.

A circuit of the charger is given in Fig 1 and Fig 2. The charger is simple with S1 selecting the charge time and S2 providing a means to initiate charging without going through the discharge sequence. The circuit constants are set up for a 7.2 volt pack.

The battery potential falling due to discharge by TR1 and R17 is sensed at pin 6. R13 and R10 are selected to stop discharge at 0.9 V per cell which is 5.4 V for a 6 cell pack.

At pin 4 an overvoltage condition can be sensed to terminate the charge at 1.6 V per cell. To enable this, remove D1 and make R7+R9 = 100 kohm. The author disabled this feature due to the particular characteristics of his battery pack which had a higher end of charge point.

At the end of the charge cycle the circuit reverts to a trickle charge mode of 3% of the mAh rating.

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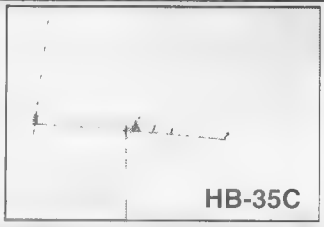

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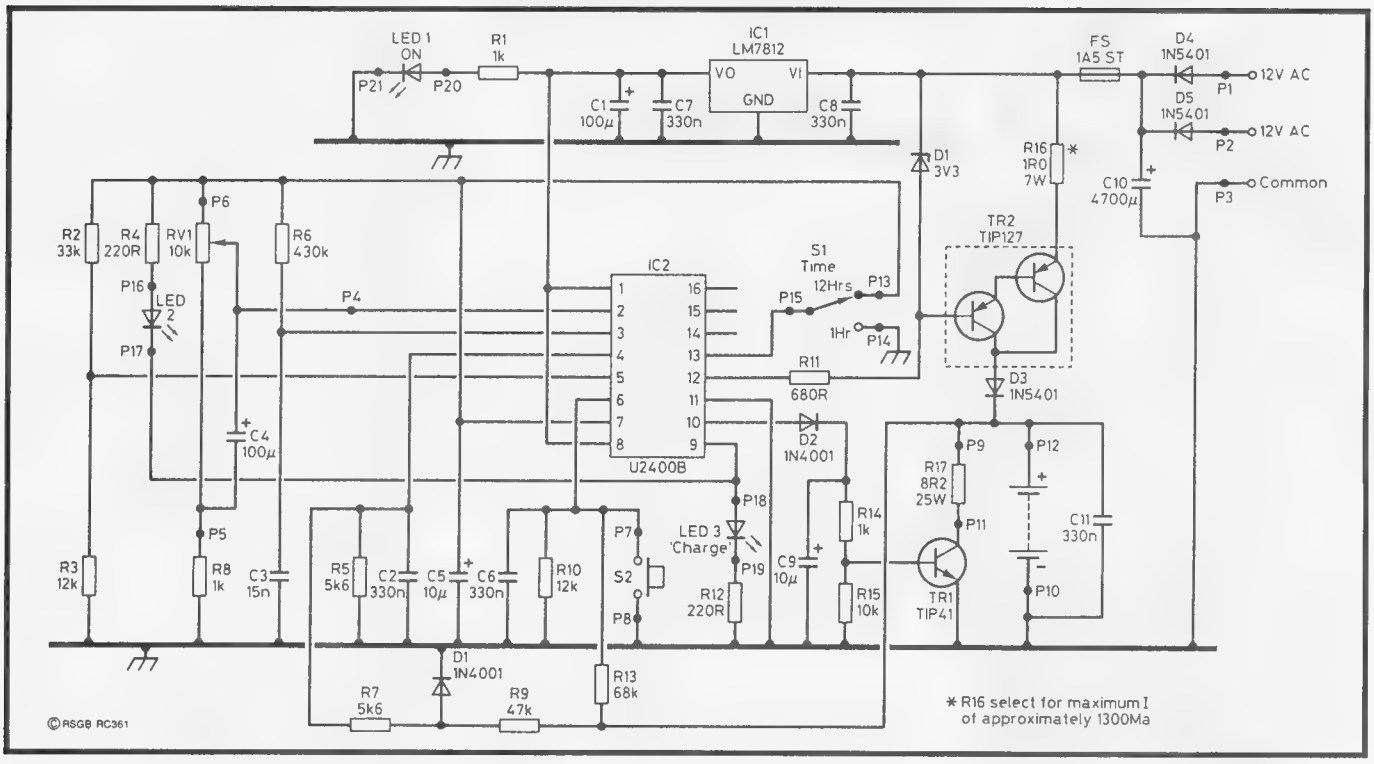

Fig 1 — Circuit Diagram of Nicad Charger.

The charge rate is set by adjusting RV1. The circuit should be switched on and S2 pressed to initiate charge. Then, with S1 in the 1 hr position, adjust the charging current into the

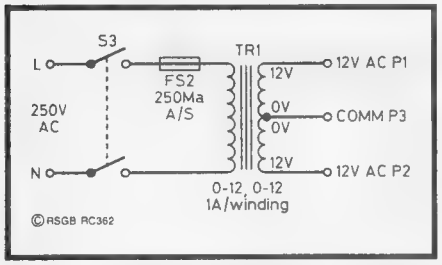

Fig 2 — Transformer Wiring Diagram.

Nicad pack to the current corresponding to the mAh capacity plus 10%.

The IC is a pulse operating type and both the discharge and the charge are regulated by varying pulses at the output. The charging times and charging currents are obtained by a basic Pulse Width variation together with an overriding on off cycle. The pulse width variation sets the basic one hour charge rate and then the lower 12 hour and trickle rates are set by turning this pulse train on and off in a longer cycle. For the 12 hour rate the battery is pulsed 200 milliseconds every 1.2 seconds. For trickle charge the 200 mS pulsing only occurs every 16.8 seconds.

Pulse operation allows the circuit to operate with less heatsinking of pass transistors. The Nicads easily average out the pulses. An option exists to connect a positive temperature coefficient resistor to pin 5 to sense battery pack heating during fast charging. However, this is usually not practical to add to existing battery packs.

If you can get the IC, this is a sophisticated charger. Obtaining from the UK should be possible but may have some inherent delays. Payment by credit card would be an option once you have established contact with a supplier. This could be done by phone or mail. A local over-the-counter supplier would, of course, be best. Let me know if you find one so I can pass on the news.

Disguised Antenna

A well disguised antenna appeared on the cover of *73 Amateur Radio Today,* November 1994 issue. The cover photo showed how Jose Rivera KP4FMD had disguised his vertical antenna. Jose had wound plastic imitation vine around his vertical so that it looked like a horticultural creation in the garden. The plastic vine would, of course, have little effect on the antenna.

If you should feel like emulating this disguise there are many businesses selling artificial plants and foliage in the Yellow Pages. They no doubt have many alternative artificial plastic plants and foliage that could be pressed into service.

Home Brew Loop Tuning Capacitor

A loop tuning capacitor with a high voltage rating which can be home-built was described in *QST,* November 1994. The author was Bill Jones KD7S who described a three foot diameter loop tuning from 10 to 20 metres with a home built tuning capacitor. The design could handle 100 watts.

Bill used a trombone configuration of copper tubing as the capacitor plates with Teflon insulation. The Teflon was thin sheet wrapped around the inner tubing. The tubing was standard copper plumbing tube.

A small motor and a long lead screw were used to adjust the position of the moving trombone section. Some "Allthread" would be

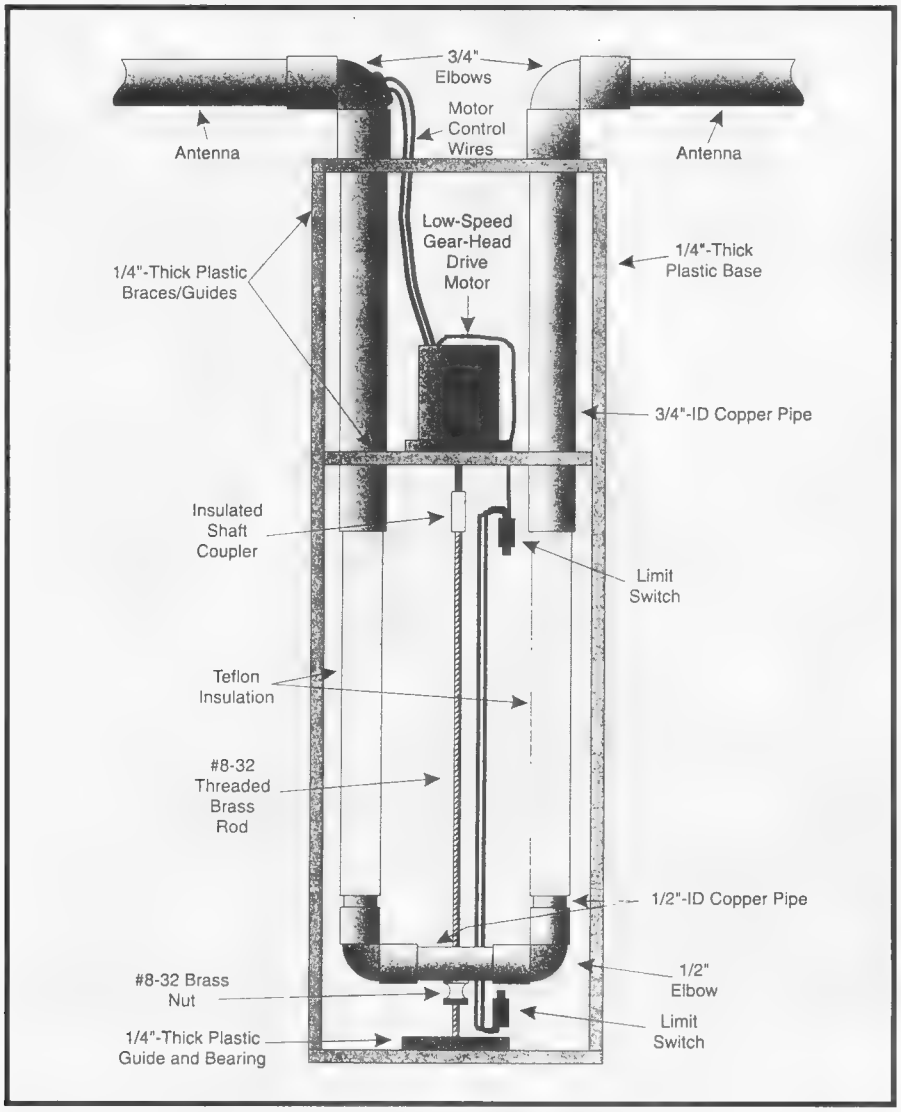

Fig 3 — Mechanical drawing of KD7S Loop Tuning Capacitor.

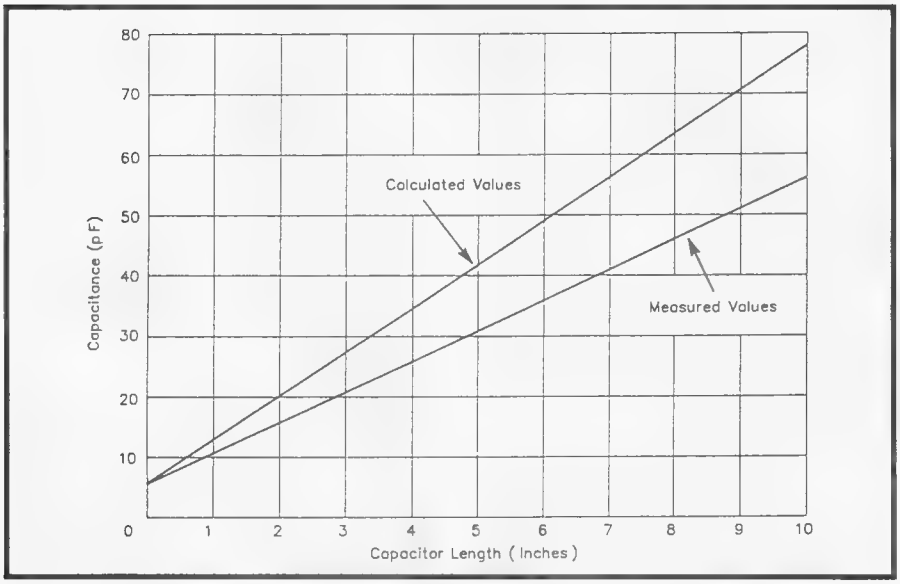

Fig 4 — Comparison of calculated and measured values of capacitance.

suitable and is readily available from hardware suppliers.

The layout of the tuning capacitor is shown in Fig 3. There are sufficient details in Fig 3 to duplicate the loop tuning capacitor. The copper tube and fittings are standard plumbing materials. The Teflon sheet should be available from plastic suppliers. The sheet need not be very thick as Teflon has a dielectric strength of 1 to 2 kV per 0.001 inch. Similarly, the structural plastic should be available from suppliers.

The results obtained by Bill KD7S and the calculated values are plotted in Fig 4. Obviously it is difficult to allow for all variables. However, the results are fairly close and show that a useful capacitor can be fabricated from available materials.

The loop antenna which this capacitor tuned was a standard design. The interesting thing was the capacitor fabrication which showed what could be done with simple materials and techniques.

*C/o PO Box 2175, Caulfield Junction VIC 3161

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WIA News

VK2ALU Wins Wilkinson Award

The 1995 winner of the prestigious Wilkinson Award for service to amateur radio, is Lyle Pattison VK2ALU.

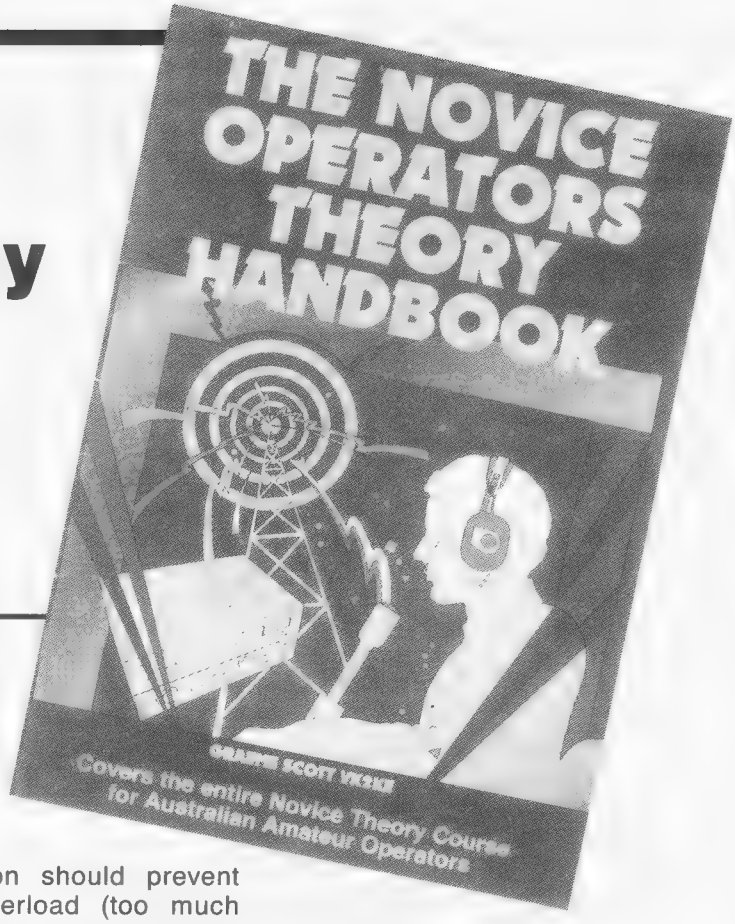
The award was determined at the WIA Federal meeting on the weekend of 4-5 February.

The citation detailed Lyle's 10 GHz world-record moonbounce (Earth-moon-Earth, or EME) contact with WA7CJO last October, which was the first known EME contact on the 3 cm band involving a station in the southern hemisphere.

Lyle is well known for his pioneering work on 70 cm, when he led the Illawarra Amateur Radio Society VK2AMW EME project in the 1970s. For many years VK2AMW was the only Australian station available on 70 cm EME, and held the world 70 cm EME record for a period.

■ Book Review

The Novice Operators Theory Handbook



Written by Graeme Scott VK2KE
Second Edition 1994
ISBN 0 959 3726 0 1
Paperback 96 pages 297 mm by 210 mm
Reviewed by Evan Jarman VK3ANI

The first edition of this book was reviewed by Bruce Bathols VK3UV in the June 1982 issue of *Amateur Radio* magazine. It was very successful with 10,000 copies being sold. One of the original authors has now revised the book. This is to make sure that it conforms to revisions in the Spectrum Management Authority syllabus.

This book has been written to help those who want to obtain a Novice licence. The content of the book is basic theory. It presumes no experience in electronics and is intended to provide only the information necessary to pass the theory examination. There are fourteen chapters of theory. They cover all the building blocks of radio: Electrical Laws and Circuits, Circuit Symbols, Semiconductors, Vacuum Tubes, Power Supplies, Oscillators & Amplifier Principles, Transmitters, Receivers, Wave Propagation, Antennas and Transmission Lines, Test Equipment & Measurement, Interference and last, but not least, Safety. A two page description of mathematics and units is also included as the other chapter. There is a set of sample questions and answers, an outline on Morse Code study and a glossary of terms.

While the book is designed to be read, rather than referred to, the author recommends reading a section a time, then using the questions as a check on comprehension. There is a large variety of topics and the author's recommendation should prevent information overload (too much information taken in too quickly without adequate comprehension). The author is an experienced technical teacher and his suggestions should be heeded.

All the topics have separate paragraphs with headings to make them easy to find. A liberal use of diagrams complement the text — a picture is worth a thousand words. There are also photographs of various transceivers and test equipment. However, on two occasions, to just refer to these photographs for "typical controls and their functions" was disappointing.

The contents of this book are designed to be easily learned. It just takes a little time for the job to be done properly. The author also provides sample examination papers (at a cost) for those wanting to check their comprehension before taking the real examination.

With experience, it is easy to get academic and quibble (especially when using obtuse logic to justify alternative answers to some of the questions), but it takes talent to keep it simple and the author has done just that.

One thing, however, did stand out, the glossary entry for decibel. It is a unit allowing power levels to be compared or calculated. It is not for comparing voltages or currents. Any decibel formula involving voltage or current is manipulation of a formula for power. The examples in the book kept to power ratio concept. In discussing attenuators, a subject related to decibels, the author did refer to the chapter on mathematics for more information on logarithms. This entry could not be found.

The needs of newcomers are easily overlooked. The author has used his teaching ability to write a book to meet this need. The book is aimed at anyone wanting to enter the hobby. I can only echo (with a name correction) Bruce Bathol's original comments.

Graeme is to be congratulated on his efforts, and a candidate who has fully studied this book, together with the SMA operator's handbook and Morse code requirements, should have little difficulty in passing the Novice operator's examination.

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■ Places

Colombia Revisited — Five Months in HK3

*David McConnell VK3YNB**

A view of Bogota.

It was September 1993 and I was about to embark on my long awaited return visit to Colombia. I had checked up on the amateur radio licensing arrangements and had found that, although all South American countries have reciprocal agreements with the USA, no such agreement was in place with Australia, so I was interested to know how I would fare when it came to using the radio as I travelled through the country.

Shortly after my arrival in the Colombian Capital of BOGOTA I was able to contact the officials of the LIGA COLOMBIANA DE RADIO AFICIONADOS, an equivalent to our WIA, who were very helpful.

Their offices are housed in a very impressive building which is adorned with a very comprehensive "antenna farm" covering all bands and modes. The radio room is quite extensive and very well equipped with several HF and VHF/UHF rigs operating as well as two 2 metre packet systems. Two operators were busily engaged in operating the HF rigs and were in contact on 14 MHz and 7 MHz. Apparently a roster of operators keeps these stations "on air" most of the time.

The organisations hold meetings each Thursday night for the various activities conducted by the Group and they are very active in the schooling of prospective amateurs as they conduct regular classes and examinations. A NOVICE licence does not require a CW test and entitles the operator to use VHF and 40 metres with an output power of 2 kW.

A FULL CALL requires CW at 10 wpm and gives access to ALL HF and VHF/UHF bands, also with a power output of 2 kW.

The cost of a Full Call Licence is 81,510 Pesos (approx $110) and the 2nd Grade Licence is 41,500 Pesos (approx $56).

On making enquiries about using my HT rig, I was referred to the MINISTRY OF COMMUNICATIONS building in central Bogota where I was informed that I would be able to go "on air" for two months without paying a licence fee. However, it was necessary to apply for permission in writing and to produce a copy of my paid up Australian licence. After two months I would be required to pay the full 2nd Grade licence fee to obtain an HK3 callsign.

Amateur radio operators show great patience and are determined to assist the visitor in any way they can.

I made contact with several American amateurs who were among many Americans who work in and around Bogota. The repeaters in Colombia are "closed repeaters" in that they are owned and operated by RADIO AFICIONADOS and other clubs and require subtones to gain access for operation by various club members or authorised operators.

The Colombian Red Cross have amateur radio installations in several of their district headquarters to supplement their own communications network in times of emergency.

As with most international travelling the language (Spanish in this case) can present quite a problem at times, but with some thought and perseverance this can usually be overcome, just as in the world of amateur radio operators show great patience and are determined to assist the visitor in any way they can.

Some Examples

Shielded braiding — *Maya protectora*
Single Sideband — *Banda lateral unica.*
Lower Sideband — *Banda lateral inferior*
Amateur Radio Operator — *Radioaficionada*
Callsign — *Indicativo*
Atmospheric noise — *ruido atmosferico*

The Amateur Bands translate to *Dos, Diez, Quince, Veintiuno* and *Ochenta Metres* (2, 10, 15, 20 and 80 metres).

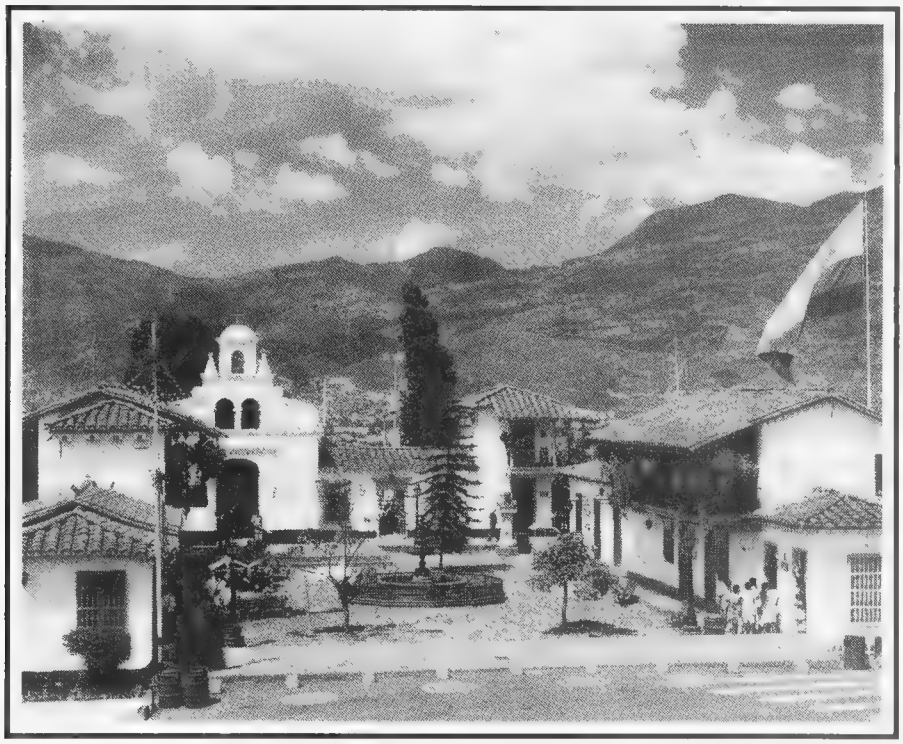
A typical CQ call becomes: *"CQ, CQ, CQ. Hola CQ, CQ, CQ. quince metros. Llama CQ en Quince metros. Esta es W2XYZ Esta es W2XYZ Llama CQ y sintoniza para unal llamada. Adelante."* (CQ, CQ, CQ, Hello CQ, CQ, CQ. 15 metres. Calling CQ on fifteen metres. This is W2XYZ. This is W2XYZ calling CQ and tuning for a call. Go ahead.)

Recognition of the call is made much harder by the fact that the sound of some of the more common phonetics are changed, eg CQ sounds like "Say Coo", QRM sounds like "Coo Ere Eme", and QRA sounds like "Coo Ere Ah". However, patience usually triumphed, and before long it was quite easy to greet my newfound radioaficionada friends *"Buenas tardes colega — El reporte de tu senal es cinco por nueve."*

In 3 city blocks I counted 52 electronic parts suppliers.

Electronic stores abound in Bogota. The two main stores sell ham radio equipment from the three main manufacturers, and undertake ALL electronic equipment servicing. In 3 city blocks I counted 52 electronic parts suppliers selling all manner of electronic and radio parts from micro chips to HUGE rectifiers and the like.

The cities of Bogota, Medellin and Girardot (pronounced hit-a-dot) are quite large and have varying climates. Bogota has an altitude of 2650 metres and an average temperature of 57° F (14° C) whereas Medellin and Girardot are bordering on the tropical rainforests and have average temperatures of about 84° F (29° C).



An historic building in Medellin.

Nearby Mt Monserrate has an altitude of 3910 metres and affords magnificent views of distant mountain ranges and the Bogota Plains. Colombia abounds with museums, art galleries, cultural displays, art, craft and food markets, theatres, fine restaurants and clubs, and the hotels offer really first class accommodation.

Historically the Plain of Bogota was the original seat of the ancient Muisca civilisation. The Muisca Indians were skilful craftsmen and goldsmiths and developed complex techniques for melting and moulding gold. They created marvellous works of art dedicated to the worship of their gods. The initial conflict between the Indians and the Spanish in 1538 and the later integration of the two cultures has brought about the intermixing which is so evident in modern day Bogota, now a city with 5 million inhabitants.

During my stay the Colombian President decreed that a population census should be conducted, and on Sunday, 24 October ALL transportation was stopped for the day. All shops were closed and movement of the public was prohibited, without special authority, for the whole day, while census takers moved from house to house. Those found contravening the laws (some 10,400 of them) were detained for the duration of the census. The population of Colombia is approx 33 million.

The San Agustin Archaeological Centre is Colombia's most popular tourist attraction with its haunting stone statues carved by the obscure Agustinian civilisation many centuries ago. These monoliths make San Agustin the most studied and most visited archaeological site in the country. The relics disclose many aspects of religion and the daily life and fate of this civilisation that left little for antiquity but their stone carvings.

Colombia is a very interesting country in many ways and has its share of outstanding natural beauty and culture but, after my five months stay, I must admit that it was great to return home to the "lucky country" and the lifestyle to which we are more accustomed.

*Box 1283 Mail Centre, Ballarat VIC 3354

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Results of 14th ALARA Contest, November 1994

1	FK8FA	Aimee	603	Top overall
				Top DX YL
				Top Pacific Is ALARA member
2	VK3CYL	Kim	452	Top VK YL
				Top VK3 ALARA member
3	VK5NYD	Nora	400	Top VK Novice
				Top VK5 ALARA member
4	VK6DE	Bev	374	Top Phone
				Top VK6 ALARA member
5	VK4NBC	Bev	353	Top VK YL CW
				Top VK4 ALARA member
				Florence McKenzie Trophy
6	VK4RL	Robyn	315	
7	VK3OZ	Pat	246	
8	VK3DYL	Gwen	237	
9	ZL1ALK	Celia	182	Top ZL ALARA member
10	ZS1AFZ	Maria	167	Top DX YL CW
				Top South Africa ALARA member
11	VK5BMT	Maria	161	
12	VK6YF	Poppy	146	
13	VK4PT	Pat	139	
14	VK4AOE	Margaret	137	
15	VK5AOV	Meg	134	
16	VK7HD	Helene	114	Top VK7 ALARA member
17	VK3KS	Mavis	110	
18	V85BJ	Barbara	109	
19	VK4SHE	Sally	97	
20	VK3XB	Ivor	90	Top VK OM
21	VK3DVT	Valda	89	
22	VK5CTY	Christine	89	
23	VK2DDB	Dorothy	86	Top VK2 ALARA member
24	ZL2AGX	Dawn	76	
25	VK3DYF	Bron	52	
26	ZL2OI	Gwen	51	
27	VK2MAS	Margaret	51	
28	VK4KRR	Ted	50	
29	ZL1BBN	Win	48	
30	VK4BGC	Graeme	45	
31	VE7YL	Elizabeth	38	Top Canada ALARA member
32	JA8GTA	Yohko	15	Top Japan YL non-member
33	JA8XJF	Tadakatsu	15	Top Japan OM
34	VK3BSP	Sth Pen ARC	15	Top VK Club station

Once again the ALARA Contest has come and gone — unfortunately this time I was unable to take part due to other social commitments on that day. From the reports I have had, both on the air and with the logs, it would appear that everyone had a very enjoyable day.

Very special congratulations must go to Maria ZS1AFZ who, in her very first contest, worked CW only with a rotator stuck in the opposite direction to VK! Nevertheless she managed a very good 167 points. Again we had our two Japanese contestants send their logs — an effort very much appreciated.

Bev VK6DE has taken the top phone score despite having a broken wire on the driven element of her quad! It was heartening to see more girls working at least some of their contacts in CW but, of course, the biggest bouquet AND the Florence McKenzie Trophy go to Bev VK4NBC who scored 156 CW points. She was heard to say later that it involved BLOOD and SWEAT! (I guess the climate contributed to the sweat, but well worth the effort, Bev.) Nora also scored towards the Florence McKenzie Trophy — better luck next year Nora.

Regarding signal reports, one contestant gave out a 4.0 and was told that the zero meant there was no contact. However, if you can hear a station but the needle does not move, surely the contact is valid. Any comments welcome on this one. Another contestant reported a YL signal splattering 10 kHz either side — this is not good and we should all look to our operating technique to avoid this sort of sin.

Several people spent time explaining the contest to DX stations they worked, who were very interested, which was valuable publicity for ALARA. Maybe we will receive more DX logs in future contests.

There seemed to be far fewer comments on the contest in general coming in with the logs. PLEASE SEND YOUR THOUGHTS — as well as comments and criticisms. We all like to know the interesting and amusing things that happen.

One comment which should be treasured this year was *"People seem to have blown the cobwebs out of their rigs"*. I hope even more YLs will blow the cobwebs out next year, even if conditions probably will not be good.

73, Marilyn VK3DMS

(Comment from VK4 — As one of the grumblers who have complained about the contest being held in summer when 80 m is so noisy, making it hard for Novices who rely on this band for at least some of their contacts, this is the first year I have experienced the contest without 9+ static. I hope we can be lucky again in 1995. ***Sally VK4SHE)***

Contest Manager, Marilyn VK3DMS, is hoping to have a bit more time in future now that she has given up the WIA Victorian Division Club News Net after eleven and a half years, but fears she may suffer withdrawal symptoms on Sunday nights for a while.

More YL Contests

Canadian Ladies Amateur Radio Association

The CLARA and Family HF Contest (most activity on 20, 40 and 80 m) will take place from 1700z on 14 March to 1700z on 15 March 1995. Scoring — five points per contact with CLARA member, two points per contact with CLARA family member, three points per contact with YL non-member, and one point per contact with OM. Multipliers — one for each Canadian Province/Territory (possible 13) and each ARRL DX country. Contest Manager: Renee Devenny VO2RD/VE3, Box 149, Osgoode, Ontario, KOA 2WO. Logs to be received no later than 14 April 1995. Open to all licensed amateurs. SSB/CW.

Thelma Souper Memorial Contest 1995

Sat 1 April and Sun 2 April 0700z to 1000z each evening, all contacts on 80 m, SSB/CW. YLs work anyone, OMs work YLs only. One contact per station each half hour. Call "CQ WARO Contest", RST, number commencing with 001. To qualify as a multiplier, WARO Member stations

must have contacts with at least 20 different stations. Bonus station ZL2YL is also a multiplier once each night. A club station where all operators are WARO members counts as one multiplier. Scoring — one point for each contact. Multiply by number of WARO members worked. Log — date each evening, time of contact, cipher sent, cipher received, name of contact. Underline multiplier contacts. Separate summary sheet — callsign, name and address, number of contacts, number of WARO members worked, score, declaration that regulations have been observed. Logs to Contest Manager, Chris Armstrong ZL1BQW, PO Box 209, Kawerau 3038, NZ, no later than 6 May 1995. Note that contacts made during this contest may count towards the **NZ WARO Century Award.**

Christine is looking forward to receiving plenty of logs from "across the pond", so take this opportunity to catch up with your sponsors and other YLs in the land of the long white cloud.

DX-YL to North America YL Contest 1995

CW from 1400 UTC, Wed 12 April to 0200 UTC, Fri 14 April. SSB from 1400 UTC, Wed 26 April to 0200 UTC, Fri 28 April. Show operating breaks in your log. All licensed YLs invited to participate. Call "CQ North America YL". All bands but no cross band, net or repeater contacts. Score Phone and CW scores as separate contests. Contacts with OMs do not count. North America includes 48 contiguous states and all Canadian provinces. One point for each station on each band. Multiply by the number of different ARRL Sections/VE Provinces/Countries. Low power — CW, 150 watts or less at all times; SSB, 300 watts PEP at all times. Multiply result by 1.5. Suggested frequencies, CW on 3.540 to 3.570, 7.040 to 7.070, 14.040 to 14.070, 21.120 to 21.150 and 28.180 to 28.210; SSB on 3.940 to 3.970, 7.240 to 7.290, 14.250 to 14.280, 21.380 to 21.410 and 28.280 to 28.410. Logs to Carla Watson WO6X, 473 Palo Verde Drive, Sunnyvale CA 94086 postmarked no later than 30 days after each contest.

International World-Wide YL Meeting — Berlin 1996

Thursday, 20 June to Sunday, 23 June 1996. This is the weekend before the Ham Radio Convention in Friedrichshafen (tell the OM). This may seem a long way in the future, but the organisers wish to know numbers of DX visitors well in advance so that travel, accommodation and other activities can be planned (eg a coach trip to the Convention after the YL meet will be organised if sufficient numbers). Interested? Contact Gertrud Szyza DK8LQ, Am Brook 5, Fassendoorf, 23701 Susel, Germany (tel: +44 4521 4827).

YL History

The stories from our "historical" YLs are coming in SLOWLY. Please, if you have received a letter asking you to participate, send in your story as soon as you can. OMs, non-members, and other readers, we would love to hear from you if you know any YL involved in amateur radio in the early days (up to about 14 years ago), or have heard any interesting stories relating to YL activity in this period. Even the information that a certain name/callsign was heard or known as being active in some aspect of amateur radio may help the historian in his detective work. ALARA members please send your information to your state representative; others can send direct to the Federal Historian, John Edmonds VK3AFU/ATG, PO Box 2175, Caulfield Junction VIC 3161.

Other News

Welcome to two new ALARA members, Ann VK6ANN (joined 6 Oct 1994) and Karen (VK3, joined 12 Dec 1995).

Congratulations to Kirsti VK9YL on receiving her #1 Honour Roll for CW from DXCC. She now also has her #1 Honour Roll SSB confirmed. What a splendid achievement!

VK3 lunches at the Vista Cafe will start again Friday, 19 February. Because of Good Friday, the April lunch will be held on the first (not second) Friday, 7 April.

*C/o PO Woodstock, QLD 4816

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):
Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/– 5 kHz for QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

400 Baud PSK Demodulator

Last month I mentioned 400 baud PSK telemetry in relation to two topics. Firstly, the new phase 3d satellite which will be carrying a similar beacon to OSCAR-13, and secondly in relation to listening for the latest news from the horse's mouth via the present AO-13 telemetry beacon. The 400 baud telemetry data format seems to have become a "standard" for the high orbit AMSAT OSCARs. There are very good reasons for this, not the least of which is to encourage OSCAR satellite users to venture into home brewing. To my knowledge, apart from one or two of the very expensive DSP devices on the market, none of the current common batch of commercially available modems will handle 400 baud.

James Miller G3RUH has made available a new 400 baud PSK demodulator in two forms. The demodulator requires no setting up and no adjustment. It is available as a bare PC board and instructions for £25 or a fully made up and tested board for £99 (Sterling). Either way it represents good value, particularly when you realise that James donates 50% of all money to the AMSAT satellite building fund. This makes it a good way to get into the telemetry business and also contribute to the on-going construction of more OSCARs. The launch of phase 3d will provide some exciting opportunities for "snooping" on the telemetry, particularly in the commissioning stages.

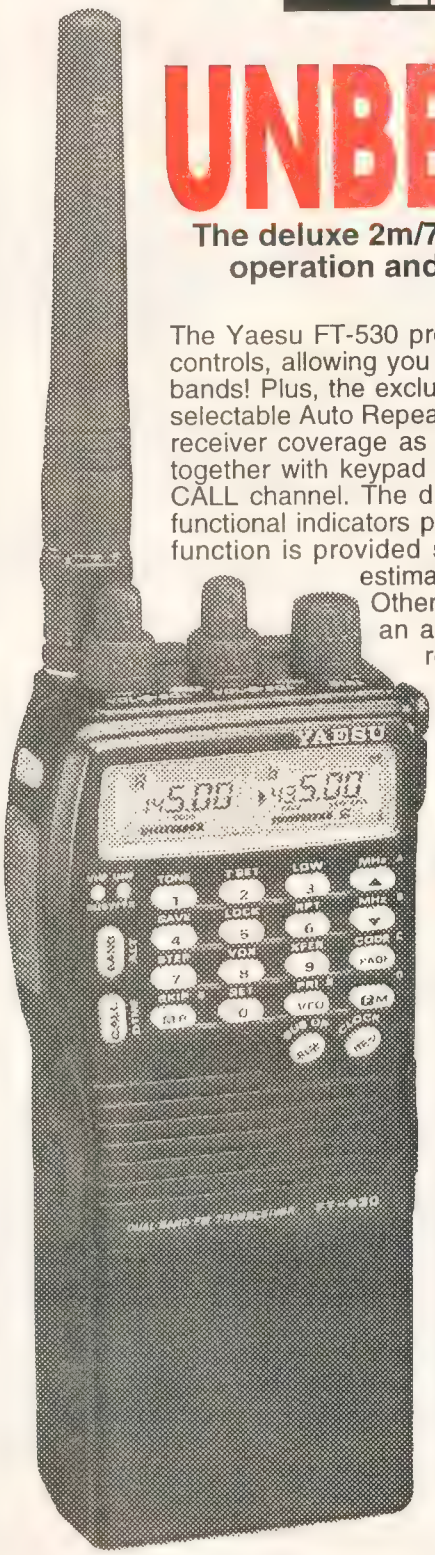
More on RS-15

Since writing last month's column the situation has become clearer regarding the new Russian amateur satellite RS-15. Several VK stations have reported working through it although signals are not strong. The set of kep elements I gave in the February column were rather questionable, but represented the best available at the time as a result of much watching and adjusting by several amateurs, mostly in America and Europe. A short time after writing the February column the situation was resolved and, since that time, RS-15 has been included in the kep sets emanating from NASA

DICK SMITH ELECTRONICS

UNBEATABLE VALUE!

The deluxe 2m/70cm dual-band hand-held Transceiver that offers easier operation and more features than ever before is still available at an unbelievably low price!



The Yaesu FT-530 provides a flexible dual receiver facility with separate volume and squelch controls, allowing you to listen on two frequencies in the same band or one frequency on both bands! Plus, the exclusive Australian version features full 70cm band coverage (420-450MHz), selectable Auto Repeater Shift on both 2m and 70cm (suits Australian band plan), and extended receiver coverage as standard. Two VFOs and 41 tunable memories per band are provided, together with keypad or dial frequency entry, seven selectable tuning steps and a one-touch CALL channel. The dual 5.5-digit LCD screen is back-lit for easy viewing and includes many functional indicators plus separate signal/P.O. bargraphs for both receivers. An LCD voltmeter function is provided so you can even monitor your battery's performance under load and estimate remaining battery life.

Other top features include: Inbuilt CTCSS encode/decode, CTCSS scanning, an auto battery saver (ABS) for extended battery charge life, a cross-band repeater facility and an inbuilt clock with alarm and snooze functions. Also provides VOX circuitry for use with the optional YH-2 headset, a user-replaceable Lithium back-up battery, and DTMF selective calling and paging. A DC supply jack allows simple transceiver powering and NiCad charging, with RF output in four selectable steps up to 5W at 12V. The FT-530 comes complete with an ultra high-capacity 1000mAH NiCad battery, belt clip, carry case and approved AC charger.

Cat D-3620

Specifications

2 Year Warranty

Frequency range:	
Transmit:	144-148MHz, 420-450MHz
Receive:	130-174MHz, 420-500MHz, 800-950MHz
Current consumption:	
Auto power off	150uA
Standby (saver on)	16.8mA (both bands)
Dimensions:	55(W) x 163(H) x 35mm (D)
Transmitter:	
Power Output:	5, 3, 1.5, 0.5 (at 12V)
RF Power Output:	2.0W (2m) 1.5W (70cm) (Supplied 7.2V 1000mA/H NiCad)
Receiver:	
Sensitivity:	2m: < 0.158uV, 70cm: < 0.18uV (Ham bands only, 12dB SINAD)
Selectivity:	>60dB
Audio Output (12V):	300mW at 8 ohms (at 12V)

YAESU

$699

Still Available At This Special Low Price!!

Clearance!

Handhelds Way Below Cost!

Yaesu FT-415 Deluxe 2m Handheld

While stocks last, grab a deluxe FT-415 at a great bargain price!

- 144-148MHz Tx, 140-174MHz Rx
- 41 memories, 2 VFOs
- Keypad and dial frequency entry
- Selectable Auto Repeater shift (VK version)
- DTMF paging, variable Auto Battery Saver, Auto Power off, VOX, DC power socket
- Complete with 1000mA/H NiCad (2W RF out), carry case, belt-clip and AC charger

Cat D-3610

2 Year Warranty **Only $399**

Very limited stocks. Some units may be ex-demo but full warranty applies.

Also available:
Yaesu FT-815 70cm Hand-held
Similar features to FT-415 except with 430-450MHz coverage.

YAESU

Only $399

FT-890 All-Mode Transceiver

The outstanding FT-890 is a rugged, 100-watt PEP mobile transceiver that covers all HF amateur bands in SSB, CW, FM and AM modes, plus provides continuous reception from 100kHz to 30MHz. Two direct digital synthesisers (DDSs) provide pure local signals and fast t/r changeover, while the low noise receiver front-end offers excellent receiver dynamic range performance. The switchable RF amplifier and a 12dB attenuator provide clear copy of even extremely strong signals, while interference rejection is facilitated by both IF Shift and IF Notch filters. Two independent VFOs per band are provided, plus 32 memories which store data from both VFOs. There's also an effective variable noise blanker, and a CW iambic memory keyer plus an adjustable passband-shifting speech processor which lets you tailor SSB transmitter audio to your own voice and microphone characteristics.
The FT-890 weighs less than 6kg, uses modular design and surface-mount components to ensure highly reliable operation and comes complete with an MH-1 hand mic. An optional internal automatic Antenna Tuner (ATU-2) is also available, which can be controlled from the front panel.

Cat D-3270

$1995

Limited Stocks

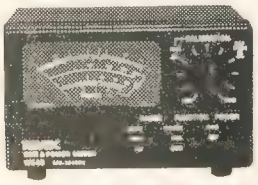
YAESU

2 Year Warranty

Quality Transceiver Accessories!

VHF/UHF Power/SWR Meter

A high quality SWR/Power meter suitable for amateur, UHF CB and commercial applications. High-quality Japanese construction assures you of maximum reliability. It has an all-metal case, large meter display, 140-525MHz coverage with less than 0.3dB insertion loss, and 4W, 20W & 200W power scales. Revex model W540.



Cat D-1370

$199

With PEP Reading! HF/6m Power/ SWR Meter

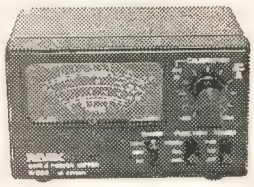
A quality wide-band SWR/power meter with accurate PEP metering. Manufactured in Japan, it's very well constructed with an all-metal case. Features include a large, back-lit meter, 1.8-60MHz coverage with less than 0.1dB insertion loss, 20W, 200W and 2kW power scales, and LED indicators for Average/PEP operation. Requires 13.8VDC at 200mA. Revex model W502

Cat D-1360

$199

Revex W56ON HF/VHF/UHF SWR/PWR Meter

Another quality Revex wide-band SWR meter, offering 2 inbuilt sensors for 1.8MHz to 525MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), SWR (at low and high power levels) and uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm.

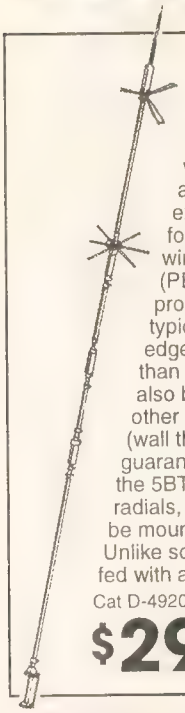


Cat D-1375

$369

Limited Stocks

Rugged HF 5-Band Trap Vertical Antenna



The rugged 5BTV is a 5-band HF trap vertical which continues the Hustler tradition of quality and performance. It incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1 kw (PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, < 2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike some other antenna designs, the 5BTV can be fed with any length of 50-ohm coax cable.

Cat D-4920

$299

HUSTLER®

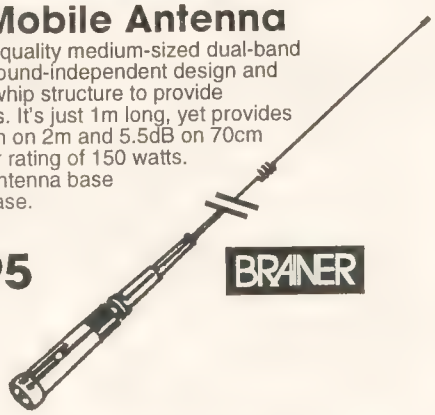
2m/70cm Mobile Antenna

The ST-7500 is a high-quality medium-sized dual-band antenna that uses a ground-independent design and tiltable stainless steel whip structure to provide excellent mobile results. It's just 1m long, yet provides approximately 3dB gain on 2m and 5.5dB on 70cm with a maximum power rating of 150 watts. Requires an SO-239 antenna base or SO-239 magnetic base.

Cat D-4810

$79.95

BRAINER



2m/70cm Hi-Gain Mobile

The ST-7800 is our best long-range, dual-band mobile antenna providing high gain (4dB on 2m and 7.2dB on 70cm), while only 1.5m in length. It incorporates an inbuilt tilt-over mechanism and has a maximum power rating of 150 watts. Requires an SO-239 antenna base.

Cat D-4815

BRAINER

$129.95

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Sydney and Enquiries - (02) 888 2105
Fax: (02) 805 1986 or write to
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PO Box 321 NORTH RYDE NSW 2113
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each week. The latest set I have is as follows and is a good fit with the AOS, TCA and LOS times for RS-15.

Satellite RS-15

Catalog number:	23439
Epoch time:	95029.78512545
Element set:	25
Inclination:	64.8142 deg
RA of node:	118.8199 deg
Eccentricity:	0.0167992
Arg of perigee:	285.7880 deg
Mean anomaly:	72.4579 deg
Mean motion:	11.27524749 rev/day
Decay rate:	-3.9e-07 rev/day^2
Epoch rev:	391
Checksum:	343

Given RS-15's high orbit (for a low earth orbiter) the keps should remain accurate for some months for manual tracking methods.

FAQs (Frequently Asked Questions)

A feature of Internet based communication in the news groups or forum areas is a series of files called FAQs. They are usually maintained by sysops or news group organisers and updated from user contribution and their own experience. It has been suggested that I could include a short segment from time to time listing frequently asked questions and, of course, answers which could be of value to newcomers to the OSCARs. It's certainly true that the same questions seem to come up regularly as new operators become interested in amateur radio satellites.

On the Internet the FAQs are available on request and newcomers are encouraged to download the files and scan them before proceeding into a new area. That's a bit hard to do in printed form but I'll begin by including one or two each month. Perhaps if they snowball it may be possible to collect them and make a feature of them at some future time.

FAQ — How do I work all the OSCARs?

You would be surprised how often I am asked this question. The short answer, rather tongue-in-cheek, is "I don't know", because I am not aware of anyone who works all the OSCARs. But the questioner is always well intentioned, so here goes.

It would be nearly impossible to make a practice of working all the OSCARs due to the different equipment requirements and sheer number of OSCARs to work. Most operators specialise and zero in on one satellite or a small group of satellites sharing similar features. Even then equipment requirements can vary widely from very simple, such as an FM rig and ground plane antenna, to complex auto-track computer controlled systems involving a shack full of expensive gear and a back yard full of complex antennas.

Usually the person asking such a question is expecting a one sentence reply. Unfortunately, to get to square one you need to at least do some preliminary reading on the subject. I usually refer them to publications such as the *Satellite Experimenter's Handbook* and suggest they consider joining an AMSAT group and read as much information as they can get their hands on.

The situation is ever changing with new operating modes, new satellites being launched and others reaching the end of their operational lives. There's no easy way. Packet radio and Internet are excellent sources of up-to-date information on what's happening day to day in the amateur radio satellite field.

FAQ — Do I really need a computer to work the OSCARs?

A difficult question. The short answer is "No, but it won't be easy and it depends on who your friends are". If you have a friend who is a satellite buff, has a computer, a satellite tracking program and a current set of kep elements, and will alert you when a particular satellite is in range and tell you which operating mode is turned on and where to point your antenna and continue to feed you this information minute by minute or provide you with a printout in advance (whew!), then you may be able to make the odd contact through one of the analog transponders.

The practical answer is "Yes". All of the above soon becomes rather tiresome for your friend. If you are developing an interest in amateur radio satellites, you had better get on first name terms with at least a simple computer. On a positive note, it doesn't have to be a super whiz-bang state-of-the-art device. An old IBM clone XT will acquit itself quite well. The basic requirement is that it will run a tracking program.

FAQ — What are Keplerian elements (keps)?

This is a very common question from someone starting out. What do those numbers mean? I covered this in detail in a series of introductory articles I wrote for *Amateur Radio* a few years ago. One of the best explanations I have come across is contained in the document file of Franklin Antonio's tracking program **InstantTrack.** This is worth reading whether you are a newcomer or an experienced satellite user.

Very briefly, the numbers are mathematical constants. Collectively they describe the satellite's orbit in terms a computer can manage. Many of them are angles describing exactly where a satellite is positioned in its orbit at a precise time. You don't have to understand them. Load them into your computer and let it work its little heart out. Keps need to be updated every week or two depending on your requirements. Satellite orbits change with time. New kep sets appear weekly on packet radio and less frequently in various amateur radio publications.

FAQ — Why don't you (that means me!) generate the tracking data and publish it in this column each month, after all...you have a computer?

Answer. Sheer volume. It would take a publication several times larger than *Amateur Radio* to contain a month's printout of all the OSCARs and it would be out of date before you received it. I'm afraid you're on your own on this one! Do what I did. Go out and buy a secondhand IBM clone XT, learn how to use it, buy a copy of **InstantTrack** from AMSAT-VK, install it and enjoy.

That'll do for this month. Maybe readers can suggest some FAQ topics.

**359 Williamstown Rd, Yarraville VIC 3013*
Packet: VK3JT@VK3BBS.#MEL.VIC.AUS.OC
CompuServe: 100352,3065

ar

Update

Apology

In the article "Capacitors at High RF Power" by Lloyd Butler VK5BR, published on pages 7-9 of the January issue of *Amateur Radio* magazine, reference to the source of diagram Figure 1 was accidentally omitted.

The diagram is copyright, having previously appeared in an article written by Roger Harrison VK2ZRH, published in the Australian edition of *Electronics Today International (ETI)* in 1976.

At the request of Roger Harrison VK2ZRH, the author of the article, Lloyd Butler VK5BR, and the editor of *Amateur Radio* magazine, Bill Rice VK3ABP, hereby apologise to the original author and publication for this omission.

It might be a good idea to correct your copy of the January issue of *Amateur Radio* now. **ar**

AWARDS

*John Kelleher VK3DP — Federal Awards Manager**

The greatest feature of amateur radio is the countless ways that there are to enjoy the hobby. Such as experimentation, packet, rag-chewing, VHF/UHF, satellite, DXing — the list goes on and on. Much of the obvious enjoyment of amateur radio was nurtured and made possible by early pioneers of the hobby, old-timers, and those who were interested enough to give it a definite profile. This, plus very obvious changes in technology, have created the very pleasant situation which we all enjoy today. Which leads me to another facet of the hobby....awards chasing, sometimes referred to, most irreverently, as "paper-hanging"!

But you don't have to be a "paper-hanger", as such, to enjoy this facet of amateur radio. More than likely, as a more than average DXer, you will have boxes and bundles of QSL cards doing little else than taking up space in some obscure storage area.

For the average amateur, there is a whole world out there beyond Club and State Awards. Begin with the major WIA awards, then tackle the International arena. If you have already earned DXCC, you have a fine start in meeting the requirements of more than several dozen colourful DX awards. The odds are that you've got some of these earned right now and don't know it.

To assist me personally, and to provide information for these pages, I enlisted help from the K1BV DX Awards Directory which, at last count, listed over 2200 awards from 125 DX countries. I will list information on this fine publication later.

Awards Tips

The newcomer to awards hunting should pay attention to this section in an attempt to keep his or her expenses down and the success rate high.

Application forms should contain all the relevant information required by the award sponsor. Make sure that your name and correct address is printed clearly, also the correct address of the award sponsor, or manager, as this information does change from time to time without adequate notice.

Don't forget to obtain the necessary signatures to verify the information in your application. Insist that your verifiers read your application before signing.

List the number of entries on your application.

Most sponsors will allow a GCR (General Certification Rule) list, in lieu of actually wanting to see QSL cards, but you do have to have the necessary cards, because spot checks are sometimes carried out by sponsors and managers. Some will accept photocopies of both sides of your cards.

Include the fee as indicated. If money is to be sent, a piece of carbon paper folded around the currency is very efficient in preventing tampering. Use blue-lined envelopes wherever possible. Include a self-addressed envelope with your application, for quick return of the verification you want.

If you must use IRCs, make sure that they are postmarked on the LEFT side. Don't hoard IRCs, as they change in format from time to time. Some you have may have already become defunct.

Attach ordinary stamps to your application envelope. Fancy commemoratives may attract unwanted attention. If you want to send nice stamps, say, to a collector, include them inside your envelope.

Read all the rules of application, and follow them. If the award rules specify certain officials, make sure that their titles follow their signatures. The rubber stamp of their Club or other organisation will often make doubly sure.

A tiny minority of sponsors will actually want to see your cards. If you want the award, then you are going to have to risk your cards. I've never lost any in the mail, but I have never rested easy until they were returned safely.

If the award is listed in several levels or modes, always specify the level or mode you are seeking.

It follows that, to accumulate the QSL cards that you want for the awards, you have to have been reasonably active for a considerable length of time, and have been diligent in sending out cards for all your contacts. Don't rely on your DX contact to send you a card, as he or she may be following the same "waiting" procedure. Remember that your QSL card may be the final courtesy of your contact.

Most Awards organisations require that you send your applications listed in alphabetical order BY PREFIX, not by country. Later logging programs now have both facilities. Again, read the rules.

A few words about your QSL card. If you want a good percentage of confirmations, your card should:

1. Be reasonably attractive (pictures are great, but not necessary);
2. Contain all the QSO data in logical format;
3. Show contact time in UTC, and be 100% accurate;
4. Indicate country, zone, and locator if possible; and
5. Be of average size,(about 140 by 87 mm), to fit the average size envelope.

Contests are an excellent way of building up your QSL card collection. After the contest, QSL all your first-time contacts either by the bureaux, or direct to the QSL managers specified during the contest. If you miss this latter information, there are very accurate and reputable listings published almost monthly. It may be that some of your DXer friends have the information you want. There are also some DX nets which devote an entire segment to giving out correct paths for certain operations.

As your collection grows, you will truly realise that DXCC, WAC and WAZ are only the beginning. Again, I say that there is a whole world out there ready and willing to recognise and reward your on-air achievements.

The address for the K1BV DX Awards Directory is Ted Melinosky K1BV, HCR 10, Box 837A, Spofford NH 03462 USA. Fees are $US17.00 surface mail and $US28.00 for airmail.

*PO Box 2175 Caulfield Junction 3161

Club Corner

Barossa Amateur Radio Club Inc

The Barossa Amateur Radio Club Incorporated is pleased to advise that the WIA Annual Radio Picnic will be held on Sunday, 26 March 1995 at Talunga Park Showgrounds, Mount Pleasant. This has become a major event on the South Australian amateur radio calendar, and promises to be the best yet.

Once again, South Australia's major retailers of amateur radio equipment are participating. These include Dick Smith Electronics, International Communication Systems and Jensen Electronics. Daycom Communications and the Wireless Institute Equipment Supplies Committee and Publications will also be there. Johnston Electronics will be setting up the latest Barrett HF equipment, Lencom and Bushcom antennas and a Magellan vehicle based GPS unit which is well worth a look.

One complete pavilion is reserved for

buy and sell, and tables may be pre-booked or hired on the day at $5 per table. These tables are not limited to radio equipment, and other hobby items are most welcome (provided it's legal), as well as handicrafts, cakes and preserves. No commission is charged.

Talunga Park is just over an hour's drive from Adelaide, with plenty of tree shaded car parking spots around the main oval. Entry to the main hall will cost $2, which also entitles you to a ticket in the door prize raffles, drawn every half hour. A large range of hot foods, drinks and icecreams will be available from on site caterers. There is plenty of room to sit under the shade of the verandah in front of the main hall. Children can make use of the football oval and well equipped playground.

The traditional transformer throwing competition will run throughout the day to ensure that all visitors have a chance to participate. There is still plenty of room in the pavilion and on the grounds surrounding the hall, and radio clubs or other organisations are most welcome to set up a display or activity in these areas. Mains power is available.

For further information, or to book a spot, ring Martin VK5GN on 085 24 3440, or write to the Barossa Amateur Radio Club at PO Box 356, Angaston SA 5353.

Stephen Bigg
Secretary BARC

Radio Amateurs Old Timers Club

Monthly broadcast. The March broadcast will be at the same times as in November, December and February, and revert to EAST as from April onwards.

The Annual Meeting and luncheon will be held on Wednesday, 15 March, commencing at 1.00 pm at the Bentleigh Club in Yawla Street, Bentleigh. The cost will be $20.00 plus drinks.

The speaker will be Dr Ken Joyner of the Telecom Research Laboratories and his subject will non-ionising radiation and its possible effects. Ken has worked in this field for many years and has travelled widely and met all his counterparts around the world.

Allan Doble VK3AMD

Notice to Club Secretaries and Radio Historians

Parts of the WIA National QSL Collection are available for exhibition at club meetings, conventions, etc.

Also photostat copies of historical QSL cards are available to writers of radio history for the purpose of illustration.

Enquire to the Honorary Curator of the WIA QSL Collection, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765 or telephone (03) 728 5350.

Ken Matchett VK3TL

Contests

*P Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Mar-May 95

Mar 4/5	ARRL DX SSB Contest	(Jan 95)
Mar 11/12	BERU CW Contest	(Feb 95)
Mar 18/19	WIA John Moyle Field Day	(Feb 95)
Mar 18/19	BARTG RTTY Contest	(Feb 94)
Mar 25/26	CQ WPX SSB Contest	(Feb 95)
Apr 1/2	SP DX Contest	
Apr 8/10	JA DX CW Contest (High Bands)	
Apr 9/10	Israel DX Contest	
Apr 9/10	"King of Spain" CW & SSB Contests	
Apr 29/30	Helvetia DX Contest	
May 6/7	ARI Contest CW/SSB/RTTY	
May 13/14	CQ-M Contest	
May 27/28	CQ WPX CW Contest	(Feb 95)

Some interesting comments were received with the logs for the last Remembrance Day (RD) contest, and it is good to see the high level of enthusiasm which exists for it. Clearly, the RD has plenty of life left in it yet, contrary to what some people might say! On the other hand it is becoming increasingly clear that significant changes are needed, to avoid the contest becoming, as one entrant says, a VHF-only event.

We obviously need to find ways to make the contest more interesting. In addition, it is probably time to downplay the importance of inter-divisional rivalry, to encourage all entrants to put in their best possible efforts, free from worrying about their QSOs contributing to the scores of other Divisions. It is time to discontinue the RD as a contest between Divisions, and make it between individuals only? What about adopting the system of bonus points used in a number of RSGB contests, where the first QSO with a new call area attracts a 10 point bonus, the second 9 points, and so on (in addition to the normal points per QSO)? This would make the rarer states well worth chasing, at least for the first 10 QSOs with each one, without raising the old bogey of what constitutes a fair points table. Can we learn anything from the highly popular ARRL "SS" contest? These are simply ideas, not solutions, and I'm sure many readers have further worthwhile ideas to contribute. I'm meeting with the RD Contest Manager, Alek VK6APK, in several weeks time, and together we will be thrashing out these and other issues. The next RD is only 5-1/2 months away, so there is not much time to lose!

Many thanks to VK3ZC, VK6APK, HA5JJ, HB9DDZ, N3RR, also *CQ, QST,* and *Radio Communication.* Until next month, good contesting!

73,
Peter VK3APN

Contest Details

The following contest details should be read in conjunction with the "General Rules & Definitions" published in April 1993 *Amateur Radio.*

Addendum to 1995 Commonwealth Contest Rules

Please add the following to the list of Commonwealth prefixes published last month: ZS1 ZS2 ZS3 ZS4 ZS5 ZS6 ZS8 (thanks VK3ZC).

SP DX Contest (SSB)

1500z Sat to 1500z Sun, April 1-2

This contest is held on the first full weekend of April, and usually has a good level of Eastern European activity. Categories include single operator (single or all band), multioperator, and SWL. Bands are 160-10 m. Send RS plus serial number; SPs will send RS plus a two letter province code. Score three points per QSO with each Polish station, and obtain the final score by multiplying by the number of provinces worked (max 49). In this contest, multipliers are counted only once, even if worked on more than one band.

SWLs must receive the callsign and number sent by Polish stations, plus the callsign worked. Each SP may be logged only once per band.

Send your log, summary sheet, and multiplier check list to arrive by 28 April to: Polski Zwiazek Krotkofalowcow, SPDX Contest Committee, Box 320, 00-950 Warsaw, Poland. Disk logs are welcome (ARRL/ASCII file format).

Polish provinces are: SP1: KO SL SZ; SP2: BY GD EL TO WL; SP3: GO KL KN

LE PI PO ZG; SP4: BK LO OL SU; SP5: CI OS PL SE WA; SP6: JG LG OP WB WR; SP7: KI LD PT RA SI SK TG; SP8: BP CH KS LU PR RZ ZA; SP9: BB CZ KA KR NS TA.

Japan DX CW Contest (High Band)

2300z Fri to 2300z Sun, Apr 7/9

The object of this contest is to contact as many Japanese stations as possible on 14, 21 and 28 MHz CW. Classes include single operator (single and multiband), single operator QRP (5 W max O/P), and multioperator (one Tx). Max operating period for single operator stations is 30 hours (show rest breaks clearly in log); multioperator stations full 48 hours. Multiop stations must remain on a band for 10 mins minimum.

Send RST plus CQ zone number; JAs will send RST plus prefecture number (01 — 50). Score one point per JA QSO on 14 & 21 MHz, and three points on 28 MHz. Points are doubled for QSOs with QRP stations (QRP stations must send /QRP). The multiplier equals JA prefectures + Ogasawara Isl (JD1) + Minami-Torishima Isl (JD1) + Okino-Torishima Isl. Send log postmarked by 8 May to Five-Nine Magazine, Box 59, Kamata, Tokyo 144, Japan. (Rules for this year's contest were not received by the magazine deadline, so the details are subject to confirmation).

Israel "Holyland" DX CW/SSB Contest

1800z Sat — 1800z Sun, Apr 1/2

This contest is designed to promote contacts between Israeli amateurs and the rest of the world on CW and/or SSB. Classes are single operator all bands, multioperator, SWL. Send RS(T) plus serial number; Israeli stations will add their area abbreviation. Score two points per 160-40 m QSO with Israeli stations, and one point per QSO on other bands. The multiplier equals the total Israeli areas from each band (counted separately on each band). Final score equals total points times total multiplier. Send logs postmarked by 29 May to The Contest Manager, Israeli Amateur Radio Club, Box 17600, Tel Aviv 61176, Israel. Awards include a trophy to the outright winner, wall plaques, and certificates to the top scorers in each country (minimum of 50 QSO points).

Helvetia DX CW/SSB Contest

1300z Sat to 1300z Sun, Apr 29/30

General rules apply. Work only Swiss stations, CW on 160-10 m and SSB on 80-10 m. You may work a station only once per band, regardless of mode. Score three points per QSO; multiplier is the total number of Swiss cantons worked (max 26 per band). Send log to be received by 14 June to: "Niklaus Zinsstag HB9DDZ, Postfach 651, CH-4147 Aesch, Switzerland". Cantons are: AG AI AR BE BL BS FR GE GL GR JU LU NE NW OW SG SH SO SZ TG TI UR VD VS ZG ZH.

World Radiosport Team Championship

July 8-9, 1995

The Potomac Valley Radio Club (PVRC) and Frankford Radio Club (FRC) have announced WRTC-95, to be held in the Washington DC area on 8-9 July 1995, during the 24 hour IARU Contest. This is a competition between fifty teams, each of two amateur radio operators, from all over the world. The championship will be judged by some of the world's top contesters, with the winners being declared the best team of two amateur radio contesters in the world.

Participants will be provided with well equipped amateur stations in the Baltimore/Washington/Virginia area, and will compete head-to-head in the same geographical area and with similar equipment. The stations will have similar transceivers, 500-700 W output power, computer logging facilities (CT, NA, or N6TR), and packet cluster. Call signs will be provided by the organisers. Entrants must bring their own headphones, microphone, CW keyer and key, and may bring their own transceiver if both operators agree. Time will be available during the week prior to the event to set up and debug the equipment. To ensure uniformity, a technical evaluation and rating of each station will be made by the PVRC and FRC. Scores will be adjusted, as necessary, to enable the winning team to be ascertained. Further assistance is being provided by various local radio clubs, in terms of social activities and the organising of accommodation.

To be considered for the event, application forms must be requested from the organisers by 31 March and returned or faxed back by 15 April. The rules for selection are involved, but basically require that applicants be currently licensed, and have scored well during 1990-94 in some of the following events: IARU, CQ-WW, CQ-WPX, ARRL-DX, WAE, AA, ARRL 10 m & 160 m, CQ 160 m.

This sounds like an interesting event, and a chance to prove your real mettle as a contester, whilst also enjoying a holiday to the USA (note: entrants will be responsible for their own travel and living expenses). I will be pleased to forward a full copy of the rules upon receipt of an A4 SASE; however, application forms must be obtained directly from the organisers at "WRTC-95, c/o Hayman Systems, 14700 Sweitzer Lane, Laurel, MD 20707-5905, USA" (fax 1-301 470 1580).

ICOM Count on us!

"VK3LZ calling!"

More sound information from Icom

Keeping up with technology isn't so hard!

Don't be put off by all the technological advancements of recent years. They may seem a little daunting at first, but once you delve into them, they offer so many advantages. Like all consumer products, amateur radios are leaping ahead with advanced features. I've ventured into packet, so don't be afraid to take the plunge. Once you get to know the new technology you'll wonder how you ever got along without it.

The new handhelds are here.

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Results of 1994 RD Contest (continued)

Following on from the results printed last month, here are some comments received (thanks VK6APK):

I've never had to work so hard for points. Only one QSO on 15, nothing on 10. Why bother with CW when you get the same points for SSB?... (VK4LV). *Not one signal on 10 or 15...* (ZL3TX). *The CW operators really had it tough. I think CW QSOs should be worth two points, or else apply the same rules as for VHF, ie QSOs allowed within the same division, every two hours ...* (VK4BAY). *A lot of fun and friendship during the contest, and it was good to see a lot of new amateurs having a go. As the 24 hours went on I was getting tired, and listening to a tape I found myself saying "QSL 102 and 887 to you 59", so we did manage to get it right (sort of), if not in the right order...* (VK3ACR). *To bring more meaning into this, arguably Australia's best contest, I suggest a roll call at the start of each year's contest of the names and call signs of the amateurs who lost their lives in WW2. Also, current holders of the calls read out during the roll call could be worth 10 points so that these honoured calls would be remembered during the contest. Ex-service amateurs could be worth two or five multiplier points, and numbers could be along the lines of: 10001 (first QSO by an honoured callsign); 01009 (9th QSO by an ex-serviceman); DE001 (first QSO by honoured callsign, DE = deceased); EX050 (50th QSO by an ex-serviceman); 59009 (9th QSO by a standard station)...* (VK4BB). *It is a pity that almost all VHF activity was on a handful of FM nets, which often led to a long wait to give out numbers. If only people would try SSB and spread out a bit! 144.100 is the DX calling frequency, and is the last frequency which should be used for contests. In future, the use of DX calling frequencies should be strongly discouraged...* (VK3KWA). *It is many years since I have operated in the RD under my own callsign, and this year I managed to improve on my personal best with a score of 352 points. In the past I have operated with the MDRC under VK3APC and, whilst I have enjoyed this, it was refreshing to operate using my own callsign for a change. Good activity in Melbourne on 2 m and 70 cm, except for the 3 am to 6 am period of course. At times the bands were rather congested! Some stations seemed confused about the rules (eg signal reports), and I can only presume they didn't read the rules before the contest. Because so many operators are now using computer logging, I suggest some guidance needs to be given as to what is an acceptable log format...* (VK3BGS). *A jolly good contest, despite the worst conditions I can remember. It was a friendly contest, although I was surprised at the poor participation with numbers seeming to be down markedly. Do we need more publicity? Or maybe another war (just joking of course, WW2 was enough, with Korean and Vietnam for dessert)...* (VK2BO). *Participation seemed to be down, and no Novices were heard. Unless more people participate, I feel the RD's importance will decline. More Novices are needed, especially on CW. They may be inhibited due to the speed that some operators use, but from my observations that shouldn't deter them because most people will reduce speed readily. The duration may affect the participation of some operators, such as myself, who can't devote 24 hours to operating. Perhaps we need awards for performance in shorter sections? It would be interesting to see the statistics of participation of each licence grade, in each section, to see what trends may be emerging...* (VK2RJ). *Thanks for your efforts. I've been in RDs over the past 20 years, and find the current level of interest disappointing, especially on VHF/UHF NB modes. In general the contest seemed flat, and I would like to see the return of the older scoring system with different points awarded for the various call areas. This would add variety and the greater thrill of the chase. Such a system is always going to be unfair to some, but it really should be considered, as one point per QSO is boring. Not many QSOs on VHF/UHF SSB; perhaps this mode needs more points per QSO than dull 2 m FM. Some changes are needed...* (VK5AVQ). *Thanks for organising the RD. Participation was well down, which I think is due to the rules. Many people now refuse to operate HF, as they can keep all QSO points within their state by operating VHF only. Something must be done to bring operators back to HF, otherwise we may as well make the contest just for VHF...* (P29VH). *If I contact a station from another state, I score a point for VK3 but the station I contact also scores a point. Consequently, nobody achieves much (for their Division) by making interstate QSOs on HF. However if I contact a station within my own state on VHF, we both score a point for VK3, which is much better for our Division! Also, on VHF/UHF I can contact the same station again on every band every hour — even better. It isn't hard to see why nearly every entrant concentrates on VHF/UHF. Meantime, what about the poor bugger in the country: even if he can hear anyone contesting on HF, he can't work his own state on HF, and gives away a point if he works another state. He is too far away to score simplex points on VHF/UHF, and can't use repeaters! There should be more points for interstate HF contacts than for "local" ones, and the station which initiates the contact should get more points than the one who responds. HF novice QSOs should also get an extra point, both ways...* (VK3JWZ).

*PO Box 2175, Caulfield Junction VIC 3161

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WIA News

International Beacon Project

At the International Amateur Radio Union (IARU) Region 3 Conference in Singapore during September last year, the Conference created the position of IARU Region 3 Beacon Coordinator, for an amateur in the region to be responsible for carrying out Region 3 policy with regard to the International HF Beacon Project.

This project seeks to establish a network of HF beacons within the region, co-ordinated with others in Regions 1 and 2 around the world.

The Singapore Conference endorsed proposals to establish HF beacons in Sri Lanka, Taiwan, New Zealand and Australia.

The WIA has appointed Roger Harrison VK2ZRH as the Australian Co-ordinator for the International Beacon Project (IBP) and nominated Roger to be IARU Region 3 IBP Region 3 Co-ordinator.

The IBP network involves a series of time-sharing beacons operating initially on 14.1 MHz, which is being expanded to operate on 14,100, 21,150 and 28,200 kHz, and subsequently to five bands, adding 18 MHz and 24 MHz. The power output is stepped between 100, 10, 1 and 0.1 watts on each frequency.

A site in Western Australia and perhaps on the East coast of the continent, are being considered.

Details of the existing network and future plans were published in the October and November 1994 issues of the ARRL journal, *QST*.

Divisional Notes

VK2 Notes

Richard Murnane VK2SKY

About Last Month

No, *VK2 Notes* didn't disappear again: "due to circumstances beyond our control" (to coin a phrase), last month's column was delayed just long enough to miss the editorial deadline. However, the text of the February column (suggestions for points to raise in your letters to the politicians regarding the proposed fee increase) was placed on the packet network several weeks ago.

Changes on Council

In mid-January, three more Divisional Councillors followed the lead of Roger Harrison VK2ZRH and resigned from Council within days of each other. John Robinson VK2XY, Terry Ryeland VK2UX and Jim Walker VK2XJW stood down and were replaced by the next highest polling candidates from last year's election. We thank the outgoing Councillors and welcome Peter Jensen VK2AQJ, Steve Pullan VK2QZ and Eric Fossey VK2EFY onto Council (Peter Jeremy VK2PJ was unable to take up his position due to other commitments).

Fee Increase Submission

As you will have heard on the VK2 weekly news broadcast, the Division decided to make its own submission to the SMA regarding the proposed fee increase. A committee, chaired by Peter Jensen VK2AQJ, comprising Dave Horsfall VK2KFU/VK2ZTB, Cesar Miranda VK2TCM and myself, prepared the document, which was sent to politicians and the SMA at the end of January. The submission should appear as an insert in this month's *Amateur Radio* magazine. The editor of *Amateur Radio Action* magazine also requested a copy, so it may appear there as well.

Thanks to those of you who expressed their views on packet (a number of SMA stations were noted reading those bulletins), and to those of you who wrote to their government representatives and the SMA regarding the issue. It looks like many of us finally found our voices and the courage to speak out. It was good to see so many amateurs taking an active role in the defence of our hobby.

Weekly Broadcast

We've had requests from one or two other Divisions for some of the background material we use on the VK2WI weekly broadcast. Perhaps the technical and historical tapes will eventually be syndicated nationwide.

In the meantime, please listen in to the weekly broadcast to keep up to date with developments on important issues that affect all radio amateurs. The times and frequencies are listed on page three of this issue. The text of each broadcast is also available on packet, and on the Internet *aus.radio* newsgroup.

Thought for the month. Taxation is the art of plucking a goose to get the maximum number of feathers with the least amount of hissing.

VK3 Notes

Jim Linton VK3PC

Broadcast Change

This month the WIA Victoria broadcast, through VK3BWI, will be on air only once, on Sunday, 12 March.

As advised on the first broadcast for the year in January, it has been reluctantly decided to have a monthly broadcast. For several years, and particularly throughout 1994, pleas made for an increase in contributions of news and information had not been successful.

Although recognised as one of the best WIA broadcasts, the high standard has relied on the dedicated efforts of a very few. All members of the 1994 broadcast team, and other interested radio amateurs, were invited to a special meeting to discuss the future of the broadcast.

While there has been no shortage of members willing to be announcers, the real need is for producers. The task requires writing, editing, and news gathering skills, and compilation and production of a half hour broadcast.

At the special meeting two producers volunteered, making it possible to put the broadcast on air once a month, on the second Sunday.

During February, as an interim measure, the broadcast went to air fortnightly. It was hoped more producers could be found to maintain this level of broadcast. Unfortunately, at the time of writing these VK3 Notes, no additional producers, or producer-teams offered their services.

The WIA Victoria Council has also decided to issue the major broadcast items under the callsign VK3WI on packet through BBSs servicing only Victoria. Important news happening in between VK3BWI voice broadcasts will also appear as packet bulletins.

Team Victoria Wins

As revealed on the VK3BWI voice broadcast, and in *Amateur Radio* magazine last month, VK3 won the Remembrance Day Contest '94. This 5th win in a row is shared by those who submitted the 212 summary sheet entries.

National single operator certificate winner Ray Cowling VK3ACR was contest champion for a second consecutive year. Congratulations to Ray, and all those who were part of the Team Victoria Campaign To Win.

Join New Members

It is pleasing to note the continued efforts of a few who are encouraging fellow radio amateurs to join WIA Victoria. Membership can cost as little as $44 a year. Due to prudent financial management we have been able to keep the fees unchanged for the past three years.

Signing up a new member is simple! Either obtain a membership application from the WIA Victoria office, or use the coupon section on the *Amateur Radio* address label flyer.

No Packet Address

WIA Victoria is unable to accept messages on the packet network. While in the past there has been a minimum use of packet by contributors for the VK3BWI voice broadcast, a number of radio amateurs have unwittingly sent material which could be classed as commercial in nature.

This is contrary to licence conditions and regulations. For that reason, WIA Victoria does not accept material or correspondence via packet.

The only methods to get material to the VK3BWI broadcast are via the mail, facsimile, or hand delivery to the WIA Victoria office.

VK6 Notes

Peter Parker VK6BWI

Thousands See Amateur Radio at Scout Jamboree

WA's biggest ever amateur radio publicity exercise was mounted at the 15th Asia-Pacific/17th Australian Jamboree held in Perth. The Jamboree, which lasted for ten days, attracted 13,500 scouts and their leaders from all Australian states and many Asian-Pacific nations. Dennis Muldownie VK6KAD organised the station which operated under the VK6SAA callsign. Other local and interstate amateurs assisted with operating the station. Four HF and two VHF transceivers were operational together with HF and UHF CB radios. The exercise

was evidently a success as the pile of brochures from the SMA disappeared very quickly!

Special thanks go to all those who gave their time to talk to the scouts over the air, although there were times when it was difficult to find contacts. During a particularly lean time on HF a scout was heard to say, *"Those (amateurs) out there could be all snobs".* He may be right. Food for thought?

John Moyle Contest Fast Approaching

Later this month it's time to go portable in the annual John Moyle Field Day. Whatever your operating interests, you are sure to enjoy yourself if you set up a HF or VHF/UHF station in the field. The rules were published on page 24 of last month's issue of *Amateur Radio.*

Stolen Equipment Register

To assist amateurs in recovering radio equipment which has been lost or stolen, the WA Division runs a Stolen Equipment Register. If a piece of your equipment has gone missing, give Roy VK6XV a call on (09) 246 3642. The same number can be used to advertise items wanted, or for sale, on the Sunday broadcast.

While on the subject of equipment, it's a good idea to note the serial numbers and any distinguishing features of any items of value in your shack. Easter is but a few weeks away and thieves know that many of you will not be home. Now, therefore, is the best time to do this little job.

Bight Spanned on 10 GHz

Australia has been placed in the forefront of world amateur microwave communication by a 10 GHz contact made between VK6KZ/P and VK5NY. The SSB contact may be a world record. It follows the contacts to Geraldton reported last month and serves as a warning to VK3 and VK7 that microwave communication with Western Australia is a real possibility.

Hills Group Promotes Amateur Radio

Members of the Hills Amateur Radio Group are promoting our hobby by erecting their portable static display on amateur radio in public venues. The display was at the Kalamunda Public Library for some time, and many of you would have seen it at the Hamfest.

Regular meetings, often with guest lecturers, are held and the group publishes a bi-monthly bulletin called *"The Beacon".* Meetings are on the last Wednesday of every month at 7.30 pm. The venue is the Girl Guides Hall on the corner of Sanderson and Brady Roads in Lesmurdie. The official part of the meeting is generally concluded quickly to make time for guest lecturers whose topics have ranged from geophysics to the Pritikin Diet!

A monthly net is held on the first Wednesday of the month at 7.30 pm. Tune to 146.450 MHz FM simplex. The Group's main positions are President, Richard VK6BMW; Secretary/PR, Norman VK6UV; Treasurer, Bruce McIlwaine; and Beacon Editor, Cy VK6IK.

The Hills Amateur Radio Group was formed in 1983 and invites amateurs in Kalamunda, Lesmurdie and surrounding areas to join its ranks. Subscriptions are $18 annually. Direct your enquiries to Richard on (09) 291 7807 or Norman on (09) 291 6055.

VK6 Gets New Correspondent

As I will be moving to Canberra to further my career, it has been necessary for me to relinquish my position as VK6 correspondent. I've enjoyed writing this column and thank all who provided material so essential for its compilation. I also appreciate the many kind comments received from readers. A successor has come forward and I hand my pen over to John Morgan VK6NT whose first column will appear next month. I urge you to support John, and will be following his columns with interest from VK1.

"QRM" — News From the Tasmanian Division

Robin L Harwood VK7RH

The main activity this month is the Divisional Annual General Meeting. As you are aware, it is scheduled for Saturday, 25 March and will be held at the Domain Activity Centre at 1400 hours local time. Notices of motion should be in the hands of the Secretary by now whilst nominations for Council should be received 21 days prior to the AGM. If an election is required a postal ballot will be sent out 10 days prior to the election to be returned prior to the election. Proxies are also to be handed in 24 hours prior to the election at the registered office of the Tasmanian Division — the Town Hall, Macquarie Street, Hobart TAS 7000.

News of the Divisional AGM will be included in the May column. The Branch elections were held last month but, as I compile this prior to the meetings concerned, details of these will be included in the April column.

The last Divisional Council meeting prior to the AGM was held on Saturday, 28 January, again at the Domain Activity Centre. All councillors were in attendance and there were two observers from the Northern Branch, namely Kevin Riley VK7AKR and Terry Brundle VK7JTC. It was a drizzly day and the usual spectacular view was lost in the frequent rain squalls sweeping across the Derwent. The meeting lasted for about three hours before we went our separate ways into the torrential rain that poured down, much to the relief of the state's rural community.

There has been quite a deal of discussion in amateur circles regarding the proposed SMA apparatus fees and this was naturally raised. What is puzzling to me was the almost total absence of written comment from VK7s regarding this, despite pleas on the VK7WI weekly broadcast from any amateur regardless of their affiliation. Quite a deal of comment regarding this issue has been generated, particularly on the packet network, and we, as Council, were concerned at some of the irrational, emotive comment that has emanated from interstate. In the meantime, we await further discussions between the Federal Executive and the Spectrum Management Agency (SMA).

The Council also looked at increasing use of the Special Events Callsigns and a recommendation is being formulated for the AGM. Several annual events are in the pipeline and it would be an ideal opportunity to publicise amateur radio in conjunction with these events. Further investigations will also be made regarding an Internet Packet Gateway within the State, which does not exist at present.

This month, the Northern and Northwestern Branches will be holding another combined meeting at Deloraine on the 14th. I am unsure where the venue will be at this stage but the VK7NB "fox" on 146.000 MHz will be operational from the site plus there will be a talk-in on one of the local repeaters.

The annual Northwestern Branch BBQ will be held on Saturday, 11 March at Legion Park near the Ulverstone Showground from 1100 hours locally.

The Southern Branch will be meeting on Wednesday, 1 March at the Domain Centre. With a date like that, I wouldn't be surprised if there will be a lot of singing plus plenty of leeks! (Try and work that out! If you're still puzzled, ask VK7JK.)

The daily "Sewing Circle" ragchew at 1700 hours locally has been an institution on 3590 kHz but, because of possible unintentional interference, has relocated three kHz upwards. However, the weekly Tasmanian Devil Net is unaffected remaining on 3590 kHz as is VK7NB'S broadcast on Wednesday. Both are on at 0830 UTC until 26 March when Tasmania reverts to EAST.

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How's DX

*Stephen Pall VK2PS**

Have you sent your individual protest letter to your Federal Member of Parliament protesting against the 92% increase in amateur radio licence fees? If not, please write to-day. It is still not too late! The more protesting letters, especially individual ones, that arrive on the doorstep of our politicians, the bigger the pressure on them. Please do something about the matter.

The battle of the elimination of the Spectrum Access Tax (SAT), the proposed new component in our licences, cannot be won, in my opinion, by a measured, dry, technical argument. The decision was made by dry, accountant-type bureaucrats from the marketing development section of the SMA. The battle can be won only by well organised political pressure.

The Parliamentary Opposition Spokesperson for Communications has already promised that the access tax will be abolished after the government change in Canberra. But that is in the future, and the future is uncertain.

The other day somebody reminded me that the possibility of higher licence fees and Access Tax was known to the WIA a long time ago and that it was widely publicised in *Amateur Radio* for the benefit of the readers. I spent some time going through the past issues of our magazine with a fine tooth comb.

Surprise, surprise! I made some interesting discoveries. I suggest you read-up old issues of *Amateur Radio* as quoted below and make up your own mind whether the details of the proposed new licence fees were known to the WIA and the readers of this magazine, or not?

Page 21-22 of the March 1994 issue of *Amateur Radio* will tell you, for example, that the communication licence fees in general are a type of a tax and that the SMA in its first year of operation (year ending June 1993) earned $82 million from licence fees, while operating costs were $45 million, thus returning some $37 million to consolidated revenue.

Page 51 of the April 1994 issue of *Amateur Radio* will tell you, among other things, about both sides of the argument whether radio amateurs should be granted a "class licence" or not. Read the WIA arguments carefully. Page 51 of the June 1994 issue enlightens you about the contents of a speech made by a representative of the SMA at the annual Convention dinner on 30 April last year. It appears he said nothing (or was it not reported?) about an increase in amateur licence fees. Apparently nothing important happened about this subject between July and September.

Page 49 of the October 1994 issue of *Amateur Radio* brings you the interesting news that the SMA will introduce separate "class licences" for CBers and that CB licence fees will no longer be payable after 30 October 1994.

At the very end it appears that all of us were caught napping due to our indifferent lay-back attitude about things that really matter.

Finally, the WIA press release dated 14 December, and enclosed as a supplement with your January 1995 *Amateur Radio,* told you that your proposed new licence fee will probably cost you $69 per year, an increase of 92%. I suggest that, in future, you should read every single line of your magazine. Once bitten, twice shy!

Auckland Islands — ZL9GD

This group of eight small islands lies in the subantarctic zone at 50° 30' South and 166° 00' East. They are subject to strong westerly winds, humidity is 80-90% and they have a rainfall of 1500-2000 mm per year.

The islands were discovered in 1806 by Captain Bristow of the British whaling vessel "Ocean". Sealing operations followed until 1830 and then changed to whaling.

Auckland Island was inhabited by a small group of Maoris in about 1842. A colonial settlement was established in 1849 by the British Southern Whale Fishery Company under Charles Enderby. At one stage up to 300 people were on the island, but the settlement was unsuccessful and it was abandoned in 1852. The area around the island is a graveyard of many shipwrecks which occurred in the second half of the nineteenth century and early in this century.

Attempts at sheep farming in 1874-77 and 1895-1910 failed. Coast watching parties were based on Auckland Island during the war.

The group of islands, together with the separate Campbell Island group nearby, are flora and fauna reserves and landing on them without a permit from the New Zealand Department of Conservation is prohibited. In the past seven years, to my knowledge, there have been only two

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groups of amateurs active from these islands.

Ron ZL9AMO, Roly ZL9BQD and Wayne ZL0AFZ/9 were active in February 1988, being part of a scientific group which sailed to the islands on the "Savannah" under Captain Ian Leask.

The second group of amateurs visited the island in March 1991. The callsign ZL9DX was used by Rick ZL1OK, Ted ZL1AVC and Jun JH4RHF. The callsign ZL9YL was used by Kumiko (YL) JR4DUW, and ZL9TPY was used by Kerry ZL2TPY. This team made 10,000 QSOs on 160 to 6 metres.

The amateur bands were jammed again this year from 25 January to 15 February 15, looking for Graham ZL9GD. Graham ZL4MV was part of a New Zealand TV documentary expedition. Due to his professional situation his free time for operating amateur radio was very restricted, usually only between 0600 to 1000 UTC on 40 and 20 metres. A further difficulty was that the TV group moved from location to location on the island, necessitating changes in timing of his activity. Graham was heard on 40 and 20 metres, being assisted by Roy ZL4BO and Jim VK9NS. QSL direct with the usual return postage and reply envelope to Graham L Dawson ZL4MV, PO Box 1516, Invercargill, New Zealand.

South Georgia VP8SGP

As mentioned earlier (November 1994 issue of *Amateur Radio*), four well known DXpeditioners visited these islands early in January 1995.

Al WA3YVN, Jan WA4VQD and Vince K5VT departed on 20 December from Miami on a flight to Punta Arenas, Chile. On 23 December they flew to the Falkland Islands for licence processing and to verify the previously issued licence of VP8SGP. During their stay in the Falklands the team checked the equipment on the vessel ABEL-J. A fourth operator, Bob Valler VP8BFH, a RTTY operator, joined the team there. During their two day stay in Port Stanley the DXpeditioners were active with the callsign VP8CBC.

ABEL-J departed the Falklands on 31 December on the 800 mile trip to South Georgia Island. During the voyage, which lasted four days, they signed VP8CBC/MM.

Operations started on 5 January and terminated on 15 January, at least 4-5 days earlier than expected.

Propagation was not the best between South Georgia and Australia on the direct path across the Antarctic. As the expedition concentrated on the areas with greater amateur population (towards the north) the opportunity to work them from Australia was limited. Grytviken, the former whaling station located on the north coast of the island and surrounded by the high mountains of the Allardyce Range, was an ideal QTH to the north but not the best in the southerly direction towards Australia across the South Pole.

DXpeditions, it seems to me, are often not aware that we here in VK and ZL do not have a Packet DX Cluster system which could give us immediate spotting information about the activity of a DX station. Many VKs and ZLs missed out when, on one weekend, the South Georgia DXpedition specifically called for VK/ZL and Pacific. Those DXers who were otherwise engaged on that afternoon missed the opportunity to work them.

South Georgia is a fascinating island and it is well known for its bird life. The British Antarctic Survey contingent, usually a group of not more than 20 persons, researches and monitors the seal and seabird population in this environmentally fragile area. A small garrison of British troops maintains a vigil against any moves by unfriendly neighbours who claim both the Falkland and South Georgia Islands. Fewer than a thousand tourists visit South Georgia annually and most of them go ashore only for a few hours.

Captain James Cook explored, charted, claimed and named the island for His Majesty George III in 1775. Cook was aboard the 462 ton vessel HMS Resolution on 14 January 1775 when Midshipman Thomas Willis saw land which Cook named after him. Willis Island is a few miles off the north west coast of South Georgia near Bird Island.

Permanent snow covers most of the treeless island, and much of the rest of the island is bare rock. *"The wild rocks raised their lofty summits till they were lost in the clouds"* wrote Cook. South Georgia is the highest, most mountainous and the second largest island of the islands that circle Antarctica. The island is just slightly over one hundred miles in length and about 2300 square miles in area. A mountain chain runs almost the full length of the island. Mt Paget is the highest peak at 2934 metres.

Whaling used to be a big industry on the island between the years of 1904 and 1966. At one stage there were many hundreds of whalers living at the five whaling stations scattered on the island. A wooden church, dismantled in Norway and reassembled in 1913 in Grytviken, has withstood the elements and is still standing today in good condition. In contrast, the cinema built in 1931 is crumbling and has fallen into complete disrepair.

If you are fascinated by the history and life on the island, then I suggest you read a very interesting article about the island titled "Wildlife Quest to the Icy Seas of South Georgia" which appeared in the *"National Geographic"*, March 1989 issue, written by Sally Poncet. Sally is an Australian from Hobart, married to a Frenchman named Jerome. During the summer they and their small children sail the icy waters of South Georgia assisting the BAS team in their work. During the winter they manage a sheep station on the Falkland Islands.

If you were fortunate enough to have made a QSO with VP8SGP, send your QSL card to John Parrott W4FRU, PO Box 5127, Suffolk, VA 23435, USA.

Bernhard H44MS on Duff Island in March 1993.

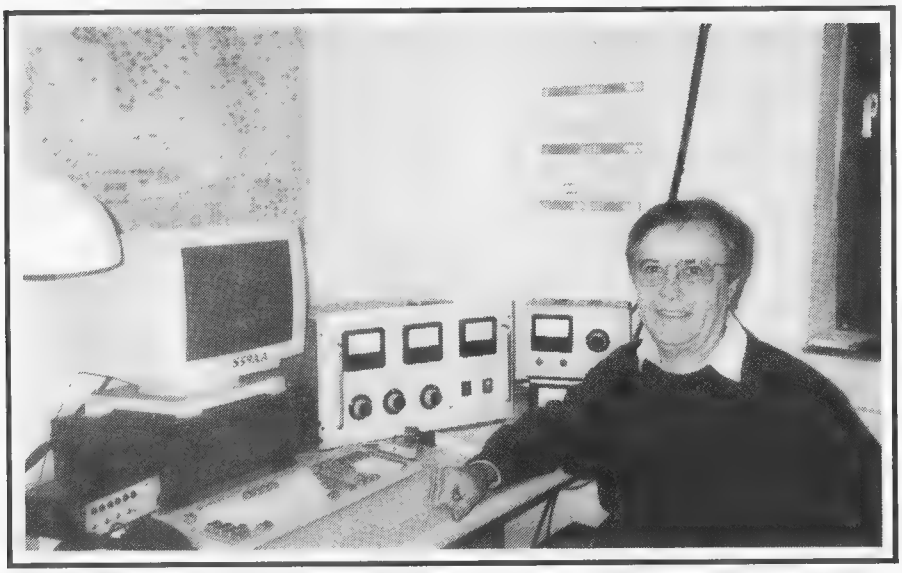
Future DX Activity

- FT5XK is Vincent who replaced Pierre FT5XJ on Kergulen Island. He will stay for one year. QSL to F6KQD.
- IA0PS in Antarctica can be worked easily around 14200 kHz on the weekends.
- 8J1RL is active on the CW section of the 20 metre amateur band. It is a Japanese base in Antarctica. QSL to the JARL Bureau.
- V5 Namibia. Sigi DL7UUO and Tom DL7UTR will be active from Namibia using the V5 prefix with their own callsign until 19 March. QSL to DL7UUO.
- VU2JPS was reported to be active from the Andaman islands. He expects to be there for two years. He was reported to be active on the 40 metre band. Hopefully he will be active on other bands soon. Check 7060 kHz around 0200 and 0730 UTC. According to KI5GF, the QSL goes to VU2JPS.
- South Shetland Islands. Contrary to earlier reports the HF0POL callsign will not be activated by the two Polish operators. Instead they will use the VP8CQR and VP8CQS callsigns. QSL to DL1EHH.
- Jean Pierre F5FHI says that he now has a valid licence and will be active in March as 9U/F5FHI.
- UA3YH will be on the air as KC4AAA during his stay on the Amundsen-Scott base for the next 15 months.
- Robin DU9RG has announced plans for a Spratly activity around 10-16 April. The callsign to be used will be DU0K.
- W1BIH is now active as PJ9JT from Curacao and will be on all bands and all modes until mid-April. QSL to W1AX.
- Pete N5TP will be active again as VQ9TP from Diego Garcia. His tour of duty is expected to last four months. QSL to N5TP.

Interesting QSOs and QSL Information

E = East coast W = West coast M = The rest of Australia

- 5Z4FM — Jim — 14227 — SSB — 1400 — Dec (E). QSL to J Stewart, PO Box 34168, Nairobi, Kenya, Africa.
- 5Z4PL — Peter — 7054 — SSB — 1934 — Jan (E). QSL to Peter Lutz, PO Box 1095, Limuru, Kenya, Africa.
- VP8CQJ — Jon — 14222 — SSB — 0651 — Dec (E). QSL to FIARC (Falkland Islands Amateur Radio Club), PO Box 260, MPA (Mount Pleasant Airport), Falkland Islands via United Kingdom.
- Z32ZM — Mome — 7007 — CW — 1940 — Dec (E). QSL to Radio Club Nicola Tesla, PO Box 179, Kumanovo 91300, Republic of Macedonia.
- 4E9RG — Robin — 14188 — SSB — 1102 — Jan(E). QSL to DU9RG Robin U Go, Tukananes, Cotabato City, 9301, Philippines.
- ET3BT — Tensai — 14226 — SSB — 1230 — Dec (E). QSL to PO Box 6128, Addis Ababa, Ethiopia, Africa.
- 9K2ZZ — Bob — 14197 — SSB — 1239 — Jan (E). QSL to W8CNL Raymond H McClure, 674 Crestlyn Dr, North Augusta, SC 29841, USA.
- AP2JZB — Bab — 14236 — SSB — 1427 — Jan (E). QSL to Jahanzeb Arbab, House 13, Street 15, Khayaban Touheed Phase V, Defence Housing Authority, Karachi, Pakistan.
- P49I — Tom — 7013 — CW — 1026 — Jan (E). QSL to K4PI Thomas M Greenway, 4055 Kings Highway, Douglasville, GA 30135, USA.
- VI6VY — Terry — 14222 — SSB — 0558 — Jan (E). QSL to W3HCW Carl F McDanie, 2116 Reed St, Williamsport, PA 17701, USA or via the VK6 QSL Bureau to VK6VS.
- XX9GD — Toni — 18130 — SSB — 0901 — Jan (E). QSL to the Manager, PO Box 1476, Macao, Asia.
- ZK1HCU/QRP — Udo — 14023 — CW — 0655 — Jan (E). QSL to DL9HCU, Udo Moeller, Wennerstorfer Str 1, D-21629, Neu Wulmstorf, Germany.



Franc S59AA in his shack in Ljubljana.

From Here There and Everywhere

- Prospective DXpedition leaders to Heard Island (VK0) please note. The following small news article appeared in the *"Sydney Morning Herald"* on 4 January 1995. *"The Federal Government has moved to protect Australia's only active volcano and the land around it. Big Ben, a heavily glaciated 2700 metre cone, dominates Australia's Southern Ocean Territory of Heard Island, 4100 km south west of Perth."*
- Henri FR5ZQ/G returned home from Glorioso Island early January, and will start answering QSL cards.
- If you post direct QSL cards to any of the Falkland Islands stations, direct your mail to "Falkland Islands via United Kingdom". Otherwise the mail might go through some South American countries and arrival at Falkland Islands is not guaranteed.
- IA0PS, the Italian Antarctic station in the Terra Nova Bay area, is remotely controlled from a distance of 2.5 km from Staff Quarters and uses 1 kW into a rhombic antenna. The station is located in the Ross Dependency claimed by New Zealand, is 380 km north of the McMurdo Base, and has a population of 72 people. QSL to IK0USA.
- It is with a sad heart I report that Percy VK4CPA, the founder of the "ANZA" Net, is seriously ill in a Gold Coast (QLD) hospital. Blood circulation and blood clot problems might necessitate the loss of one of his legs. DXers and many friends of yours, Percy, wish you a speedy recovery.
- T31JK Bill (home call GW0OJK) is sailing with his XYL in the Pacific Ocean. He said in a QSO with me that he has been sailing for the past seven years and will continue to do so in the future. Bill is not a DXer and he is not in the QSLing business. He uses amateur radio for fun and for chit-chat. He was very active from the Canton Island Lagoon with his amateur station

on board an anchored yacht. He was overwhelmed by the pile up created by his callsign and by the request for T31 QSL cards. He has no QSL Manager and promised to post computer generated QSL cards from the next available post office which is in American Samoa in April 1995. It seems to me that Bill is unaware of the DXCC rule (Basic rules, 8) that all stations contacted must be "land stations". Contacts with ships and boats, anchored or under way, and airborne aircraft, cannot be counted for DXCC purposes.

- Patrick J20UFT is active on the Brazilian Net, 0900 UTC daily on 14240 kHz.
- VI6VY celebrates 100 years of community service by the Shire of Harvey in Western Australia. It will be active from time to time during 1995. QSL to W3HCW or via the VK6 QSL Bureau to VK6VS.
- If you want contacts with South East Asian countries, check in to the "SEA Net" each day at 1200 UTC on +/– 14320 kHz.
- Well known DXer Bill J88AQ passed away on 1 January 1995.
- Watch out for the special event station VI75RAAF to be active in 1996 celebrating the 75th Anniversary of the Royal Australian Air Force.
- Bob A92FZ (home call VK1BOB) was active on 20 metres. His QSL address is PO Box 15763, Adliya, Bahrain.
- There is some confusion about the correct QSL address of XT/TU5BA. The address is Harry Chamberlain, American Embassy, Department of State, Ouagadougou, Burkina Faso, Washington DC 20521/2010 USA.
- AP2AMA is a new operator. He wants QSL cards to be sent to PO Box 1450, Islamabad, Pakistan.
- Can anybody beat this record? Dietmar VK2APK (as at 25 December 1994) told me that so far he has made 277,000 QSOs and taken part in 366 contests. Dietmar gave up QSLing many years ago.
- T30XP Peter left Tarawa on 9 February and returned to Australia. He asked that QSL cards to be sent to his home call VK1XP. The problem is that his home address in the 1994, and presumably in the 1995, International Call Book is incorrect. His correct home address is P A Dalton, 29 Govett Place, Holder, ACT, 2614, Australia.
- The Dutch National Amateur Society, VERON, is celebrating the 50th Anniversary of its foundation. VERON club stations with the P14 prefix may use the special prefix of P150 throughout the year. Individual stations might add the number 5 to their normal prefix during the month of May.
- Special event station CG6ARC was active from 25-26 February from the Canada Winter Games. QSL to CG6ARC, PO Box 767, Grand Prairie, Alberta, T8V 3R5, Canada.
- At least a dozen Japanese amateurs, members of the Japanese UNICEF Ham Club, were active from Nepal for a short time. Callsigns used were 9N1AT, AS, WN, CC, WX, AX, IZ and IB.
- Said SU1SK says he has no QSL manager and cards should be sent to PO Box 62, Shobra, Alkima, 13411, Cairo, Egypt.

STOP PRESS — DXpedition to Conway Reef — 3D2

Mats SM7PKK visited Conway Reef as part of a seven man team DXpedition in May 1990. News reached me, just before closing time for this issue, that Mats, in company with Pekka OH1RY, NI6T and SM6CAS will be active from Conway Reef from 24 March to 3 April. They will have three 1 kW stations of which two will be operating 24 hours a day. They promise to give a good coverage on the low bands. Operational frequencies are to be CW on 1823, 3503/23, 7003/23, 10103, 14003/23, 18071, 21003/23, 24893 and 28023 kHz; SSB on 1843, 3785, 7085, 10135, 14195, 18115, 21295, 24935 and 28495 kHz; and RTTY on 7030, 10120, 14082, 18100, 21082 and 28082 kHz.

The Budget of the expedition is $US15,000, not counting personal tickets and hotels. More details about this DXpedition will appear in the April issue of *Amateur Radio*. Send your donations to SM7PKK Mats Persson, Zenithgatan 24 #5, S-212 14 Malmo, Sweden (this is the new correct address).

QSLs Received

FK8GM (3M op) — KP4TK (3M op) — T31BB (3M DF6FK) — YB3OSE (4M W7TSQ) — EA9KQ (2M op) — HC4L (4M op) — LZ1KBB (2M op).

Thankyou

Many thanks to those who kept me informed, but especially to VK2DSL, VK2KCP, VK2KFU, VK4AAR, VK4CY, VK6VS, SM7PKK and T30XP, and the following publications *QRZ DX, The DX Bulletin, The DX News Sheet,* and *National Geographic.*

73 and Good DX

PO Box 93, Dural NSW 2158
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Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Digital Intruder

One turns on the receiver and finds three strong carriers on 20 metres. The strongest is S9 on 14.111 kHz, the others are less than S7 on 14.024 and 14.200 kHz. These signals are present 24 hours a day, seven days a week and have been around for the last five months.

Where are they coming from?

Answer! A two section compact-disc player in the neighbour's house next door. The CD transport section appears to be the culprit. The digital interconnect lead was apparently acting as the antenna.

It was tracked down after going HF mobile. Upon returning home the signal was strongest and had a range of one km.

Connect up a hand key and go QRP CD CW!

Adrian Fell VK2DZF
PO Box 344
Baulkham Hills NSW 2153

Touch Lamp

I would like to let all operators and SWLs know about the rotten signals being radiated by so-called "touch lamps". After months of suffering I finally found one belonging to a neighbour. We were both amazed by the noise it produced when close to a portable receiver.

On my FT 890 next-door at 7 MHz, it was 50 Hz FM with a bandwidth of 30 kHz. The second harmonic on 14 MHz was also strong. Close to the lamp it was an unbelievable mess, also on 11, 12 and 18 MHz, and drifting upwards.

The lamp has a free running oscillator in its base, sensitive to "hand capacitance", and its signals are effectively radiated by the power lines. Downpipes, water piping and power line to a garden shed also helped radiation.

Others may have been troubled by this type of interference and wondered about its source. A strong RF signal may be able to turn such a light off or on. In my opinion a good cure would be a well-handled hammer!

I have written to the SMA and await their comments. I understand devices like

this have been mentioned in *Electronics Australia*. Does the WIA have any comment?

Jack Swainger VK3IP
28 Lording Street
Ferntree Gully VIC 3156

(The two preceding letters, plus that from VK5EK last month, certainly show that there are many potential sources of interference being marketed. The WIA can only bring such complaints to the notice of the SMA. Permanent corrective measures may take a long time. Ed.)

That's Defamatory

Bruce Hedland-Thomas is right on the mark with his remarks about conflict resolution within our ranks (*Federal QSP, December 1994*). It's sad to see, then, the same issue featuring yet another "barrow push" on the subject of defamation (*Packet Radio Users and the Law, WIA News*, page six in the same issue). We've finally managed to rid the *VK2 Notes* of that particular fixation but, alas, it appears to have migrated to other parts of the magazine!

It seems to me that these repeated threats of defamation action have been aimed at suppressing fair comment on the various goings-on within the Institute (as does the policy of preventing any such views being aired within the pages of *Amateur Radio*). Packet radio, as the only remaining means of airing views for group discussion, has come under attack from some of the very people who should be defending it.

In VK2, of course, we've had repeated abuse of amateur privileges on packet, particularly from one or two who appear to be, shall we say, "a few countries short of DXCC:, or "a few elements short of a beam". They've even attacked our Divisional and Federal representatives (and their spouses) though with apparent impunity. If such individuals can so viciously attack others without official reprisal, how real is the threat to the amateur community as a whole?

Instead of threatening the entire amateur community (especially BBS sysops, who are usually too busy to scan every single message that passes through their systems), shouldn't the WIA be working to reduce or eliminate the burden they face? I think our Institute representatives, especially those who liaise directly with the SMA, ought to examine their priorities. Perhaps if they spent more time on air talking with their fellow amateurs, they'd be more in touch with the realities of the situation.

The key, as Bruce points out, is to **communicate** with each other, so we can seek and find novel solutions to the problems we face, instead of resorting to the same old legal "remedies". We in VK2 have had a belly full of that, thank you!

When you get down to it, shouldn't we, as amateurs, be a "Society of Friends"?

Richard Murnane VK2SKY
7/15 Grafton Crescent
Dee Why NSW 2099

*(There is a policy regarding publication of politically controversial opinion in **Amateur Radio,** where it might be defamatory of individuals or Divisions. Its purpose is not to suppress **fair** comment, but to inhibit **unfair** comment. Particularly when seen from a distance, the border-line is often rather vague! **Bill Rice VK3ABP, Editor.)***

FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

Yet More New 10 GHz Records

Last month a 10 GHz contact was reported between VK5NY and VK6KZ on 30 December 1994. The distance is 1912.1 km and is definitely a new world record.

There is also a new VK1/VK2 record of 218.4 km between VK2ALU/1 on Mt Coree and VK2ZAC/2 on Mt Canobolas on 2 Jan 1995. Over the past few months I have processed nine new state records, four new national records and two new world records, and there are more in the pipeline. At present almost every active 10 GHz station in Australia holds a distance record of some kind!

80 Metre DX Window

Once again, yet another attempt to get the facts straight. The item on page 56 of last month's magazine is incorrect. The band limits of this window are 3795 — 3800 kHz. For an LSB signal to be within the band, the lowest possible suppressed carrier frequency will depend on the filter bandwidth but will normally be 3798 kHz.

I have heard people make comments on the air like "The SMA hasn't told me that this is the rule, so I'm going to continue as before". A crazy attitude. I wonder how many people ignore the road traffic rules for the same sort of reason. The SMA publishes the regulations and it is the responsibility of each amateur to know what they are and to abide by them. The rules have ALWAYS required us to confine our emissions within the band limits.

Fortunately, most of the out of band operation has stopped and very few stations are still ignoring the rules. But we are still on thin ice with this band and even a minority can spoil things for everyone else. Do not let fools place your operating privileges at risk.

Band Plan Revision

Federal Council has formally approved the band plan changes discussed over the last few months.

Details of the revised plans for the 23 cm and 13 cm bands were published on page 77 of December 1994 *Amateur Radio*. On the 23 cm band the main changes are the new FM simplex segment at 1294-1295 MHz, and the new simplex data segment at 1297-1300 MHz. No firm date has been set yet for existing repeaters to change over to the new 20 MHz offset. Please note that the 1270-1280 MHz guard band still applies in some areas until the 1275 MHz CAA radars close down.

The 10 metre proposals have been changed in order to avoid interference problems with overseas FM activity. The nine domestic FM channels will become 29.12-29.28 MHz, and the SSB/CW segment will become 29.0-29.1 MHz.

On 2 metres and 70 cm the main changes will be the new packet channels discussed over the last few months. These changes partly depend on our new licence conditions and will be detailed in full when the SMA releases the final version of the new regulations.

**PO Box 2175, Caulfield Junction, VIC 3161*

When you buy something from one of our advertisers, tell them you read about it in the WIA Amateur Radio Magazine.

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

Region 3 Monitoring Service News

The IARU Region 3 Monitoring Service Co-ordinator, K Wahrlich ZL1CVK has provided the following news release.

The end of another year of hard work by the Region's MS Co-ordinators and their contributors was highlighted by the Singapore IARU Region 3 Conference. Monitoring matters had a high profile at the conference and an increased awareness of the problems faced by amateurs in the region was a welcome outcome.

Many societies have pledged assistance, and already ARSI have a monitoring system up and running. JARL have offered equipment to assist in the setting up of a monitoring system to those societies requesting help. ORARI have managed to get their government to take some very positive steps to help eliminate intruder problems within that country.

As the Regional Co-ordinator, I would like to take this opportunity to say a heart felt "thank you" to the system co-ordinators and all those amateurs and SWLs and others who have helped to increase the effectiveness of our fight against intruders. Many of these people have become personal friends and I feel fortunate indeed to be able to work with them.

The International, Region 1, 2 and the DARC Co-ordinators have played a major part in the Region 3 Monitoring System also by the continued sending of reports and other information. Parts of these packages have been sent to all Region 3 Co-ordinators and help to identify intruders and often act as a means of verification for many of the things which we hear.

Without all of these efforts we would not have an effective world wide Monitoring System. I firmly believe that we are winning the fight.

1995 is a new year and I look forward to working with you all.

Frequencies to Monitor

Would observers please check the following:

14.343	ID?	mode A1A	1200z	Chirpy signal 9+
18.075	ID?	mode J3E/U	0830z	
18.100	ID?	mode J3E/U	0620-34z	
18.116.9	ID?	mode J3E/L	1520-30z	non amateur
21.448.8	ID Radio Tirana		mode A3E	is anyone hearing this station in Australia?

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

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An Old Timer Reflects....

The late Des Greenham VK3CO continues to look back over his 50 years of amateur radio operation.

After the war (WW2) we had resumed operation on the air, restricted to 10 metres only. The year was 1946 and, of course, we were using AM, the only form of modulation at that time. We were all using open wire tuned feeders to connect with our antennas. Coaxial cable was not available at this time, We had read about it and had seen it used by the military services.

Another new product had hit the market in the USA but was not available here. This was a 75 ohm twin feeder line known as "Twin Lead". We had seen this used by operators in overseas magazines but it was not available here.

One day I was on air and happened to have a contact with an American on board a merchant ship coming into Melbourne. He told me he had to observe radio silence once he came within the coast limit. He requested my telephone number and invited me to visit him on his ship when he arrived in port. To me this appeared to be a great opportunity, not only to meet Salvador, but also a chance to look over his ship which was relatively modern.

In due course he arrived in port and, after the expected phone call, he visited my home and had dinner with us. He was a very nice guy and we all enjoyed his company. Later, I was to visit him on board the ship. On the appointed day I arrived at the dock in Melbourne and, after passing through strict security, I was ushered on board there to spend a most pleasant time inspecting this modern ship with turbine engines, etc.

After enjoying the tour of the ship, we ended up back in Salvador's radio shack. Here he had the latest in ham radio gear. During this time I noticed he had some parcels on the floor ready to post. To my horror I noticed he had them tied up with, you guessed it, 75 ohm Twin Lead!

When I mentioned this to him he showed me an enormous drum of the cable and he used it like common string to tie his parcels ! He was surprised at my interest and rolled off a large quantity saying, "take this home with you".

When I mentioned about security, he suggested I stick the roll up my jumper and just casually walk off! Being very anxious to get this new cable home, I did just this. Imagine my consternation when the security guy wanted me to stop and have a chat. I tried desperately to be calm and casual, fully aware of the bundle up my jumper. In due course I was able to walk through the gate and, resisting the temptation to run, get back to the car and drive home. Phew, what a relief!

I decided there and then that "smuggling" was not my career path. However, I used the cable successfully for many years after that, despite my guilt feelings.

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Have you advised the WIA Federal Office of your new Callsign? Use the form on the reverse of the Amateur Radio address flysheet.

Pounding Brass

*Stephen P Smith VK2SPS**

It's been a very busy month for me. I have just started a new career, leaving behind 14 years of service in the Telecommunications Industry, and moving into the electronics side of television and video recorders, etc, something I find extremely challenging.

Over the last couple of months I have received some very interesting letters from readers which I have been unable to include in past issues due to space restrictions. I will now take a back seat and present them in this issue, and hope you enjoy them as much as I did.

From Peter VK6BWI, QRP Club 66, taken from *Selected Poems* by Les L Murray 1986, published by Carcanet Press Ltd Manchester.

"MORSE"

Tuckett. Bill Tuckett Telegraph Operator, Halls Creek,
Which is way outback of the outback, but he stuck it,
Quite likely liked it, despite heat, glare, dust and the lack of diversions or doctors.
Come disaster you trusted to luck, ingenuity and pluck.
This was back when nice people said pluck; the sleevelink and green eyeshade epoch.
Faced, though, like Bill Tuckett with a man needing surgery right on the spot, a lot would have done their dashes.
It looked hopeless (dot dot dot). "Lift him up on the table", said Tuckett, Running the key hot till Head Office turned up a doctor who coolly instructed up a thousand miles of wire,
As Tuckett advanced slit by slit with a safety razor blade, pioneering on into the wet, copper-wiring the rivers off,
In the first operation conducted along dotted lines, with rum drinkers gripping the patient:
D-d-dash it, take care Tuck! And the vital spark stayed unshorted. "Yallah!" breathed the camelmen.
"Tuckett you did it, you did it!" cried the spattered La-De-Dah jodhpur-wearing Inspector of Stock.
We imagine, some weeks later, a properly laconic convalescent averring, "Without you, I'd have kicked the bucket...."
From Chungking to Burrenjuck, Morse keys have mostly gone silent and old men meet now to chit-chat in their electric bygone dialect.
The last letter many will forget is Dit-Dit-Dit-Dah, V for Victory.
The coder's hero had speed, resource and a touch.
So Dit Dit Dit Dah for Bill Tuckett.

Thanks Peter for the above poem. I wonder how many times situations occurred where medical advice was passed down the line before the Flying Doctor Service came into being?

Movies and Morse Code

How many times has Morse code been portrayed in the movies, from the very professional to the downright ludicrous such as many of the older cartoons?

I have included the following from Graham VK6RO at Ferndale WA. Graham is interested in Morse code as used in the movies.

"The Runaway Train" In this movie the characters are sent "de K3NF". I wonder if K3NF was on the set at the time?

"The Hunt for Red October" In the movie the message "de WLO RTTY" is sent just as a submarine is breaking the surface. WLO is the callsign of a coastal Marine Radio Station in Mobile, Alabama in the USA. Perhaps they recorded a short burst of WLO transmission and used it in the movie?

"Operation Daybreak" In this movie the characters "UKL de QFAO nr 70109130/ 7V3" are heard. What does it all mean?

Last year there was a hit record called "The Tide is Turning" on the broadcast radio in Perth, and at the end of the record a lot of "CW" type music was heard, but I don't think it makes much sense.

I mentioned to Graham two movies that came to mind were the B & W version of **"Titanic"** when the radio operator sent out the SOS, and a comedy, **"The Three Stooges Go West"** where the Indian smoke signals are high speed Morse.

If anyone has come across Morse in the movies, please drop me a line.

This last poem was sent to me from SA, but with no name or callsign. I would appreciate the person who sent it letting me know his name and callsign. The poem appeared in *Radio Communications* (August 1994, page 28).

The Air Signaller's Prayer

In days of old,
When W/Ops were bold,
And sidebands not invented,
The word would pass by sounding brass,
And all were well contented.
Amen.

**PO Box 361, Mona Vale NSW 2103*

Spotlight on SWLing

*Robin L Harwood VK7RH**

This month will see major changes to the shortwave scene due to propagation changes from Summer to Winter. Hence the 26th of this month will see most Northern Hemisphere broadcasters make their frequency alterations to coincide with the introduction of Daylight Saving Time on that date, particularly in Europe and the CIS. Programming to other areas is usually fixed in UTC, yet releases to Europe and North America are usually an hour earlier than Winter schedules.

As I am compiling this in late January, no updated frequency information is to hand and, if I did include this, there would not be sufficient room in this column. However, both the Fidonet and Internet rec.radio.shortwave echoes do post some schedules as well in many monthly bulletins of your favourite club. I am also surmising that the proposed regionalisation of the BBC World Service could also commence around this date although I have not heard anything lately on this endeavour.

The Italian Public broadcaster, RAI, was rarely heard in this part of the World but now Rome can be heard via the BBC Kranji senders, broadcasting to Asia from 1000 to 1100 UTC. This Italian language program is on 11850 kHz and is at excellent strength. Radio Japan from Tokyo is also making increased use of this BBC Singapore relay facility and can be heard on 11740 in English at 0500 UTC. The recent tragic earthquake in Kobe was covered extensively by Radio Japan and I felt it was more in-depth than many other international broadcasting stations.

The "Voice of Russia" has made a number of cutbacks due to budgetary constraints to the point that it is difficult at times to even find it. This is in stark contrast to when the station, then known as "Radio Moscow", was easily heard just about 24 hours a day! The number of external service outlets are also well down compared to August 1991.

Radio Kol Israel also axed several English language releases of their

evening programming which particularly upset many North American listeners. As well, programming in Spanish to Latin America was also axed. The shortwave relays from the domestic Hebrew networks remains unaffected. The 15 minute morning English release from Jerusalem continues as previously, followed by the French broadcast, but will commence at 0400 UTC when Israel goes on to Daylight Saving Time sometime in March.

Another Cold War relic, Radio RIAS in Berlin, closed down on 31 December, and was absorbed into the domestic German networks. The acronym "RIAS" stood for *Radio In the American Sector* and was located in West Berlin. It could be heard well in Europe and beyond on 6005 kHz and, although German programming continues on that channel, it is one of the domestic networks. Incidentally, all occupying allied troops have now left Berlin so programming from various armed forces networks has ceased from within Berlin, eg AFRTS from Washington, the BFBS from London, French Forces Radio, Canadian Forces Radio and Radio Volga from Moscow. The Americans and British continue in western parts of Germany near the Dutch border on a much smaller scale than previously.

Incidentally, our own "Australian Defence Forces' Radio" based in Canberra continues to broadcast on non-standard broadcasting allocations. They are usually on between 0300 and 0400 and repeated at various times of the day namely 0930 to 1030 and 1330 to 1430 hrs. Times and frequencies can change so you may have to tune around but I usually find them on higher frequencies on the earlier releases dropping down lower at night. Try tuning around 18 MHz, 13 or 10 MHz USB and you will come across them. They also welcome reception reports, especially from overseas. Target areas are where Australian military personnel are serving overseas, particularly Rwanda and SE Asia. Programs are in English and consist of news from home plus dedications from family members.

Well, that is all for this month. Don't forget, if you have any news I can be reached at the addresses shown. Good listening and 73.

*52 Connaught Crescent, West Launceston TAS 7250
VK7RH@VK7BBS LTN.TAS.AUS.OC
Internet: robroy @clarie.apana.org.au
Fidonet : Robin.Harwood 3:670/301@fidonet.org

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QSLs from the WIA Collection

Ken Matchett VK3TL Honorary Curator WIA QSL Collection*

VK3ACD

This QSL was sent from Heard Island in January 1948 for an operation which, one would think, would have been the first amateur radio operation from the island. The operator, Alan Campbell Drury, used his own allocated call several years before the prefix VK1 (and later VK0) had been used for callsigns to denote Macquarie Island. The card was for a CW contact on 40 m with Quintin Foster, then VK6QF. Alan has written on the reverse side of this QSL, *"Tnx OM — vy gud QSO Quintin — the first communication with the outside world from Heard Is. CUL Alan".* Alan used a Type A MK3 (five watts) which was his own since the original officially supplied equipment had been rendered useless due to immersion in the sea.

Sadly, Alan passed away only a short time after addressing an Old Timers' Luncheon in March 1993 in Melbourne at which he gave a most interesting account of his experiences on that lonely island and the historic radio contact with the outside world.

Original card donated by Quintin Foster.

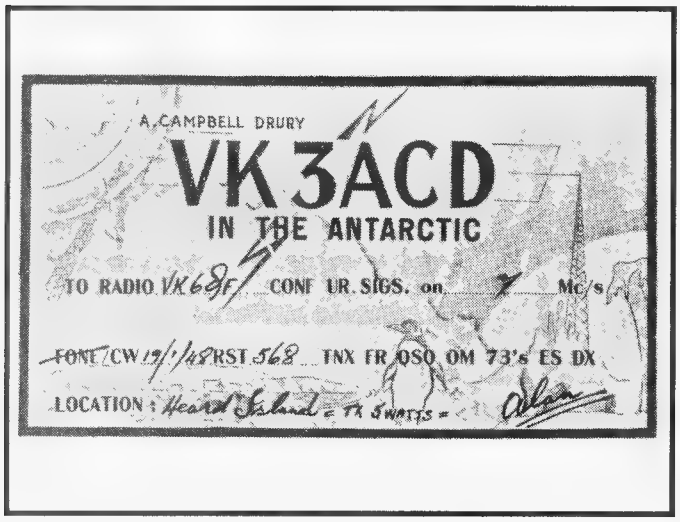
DF0SSB

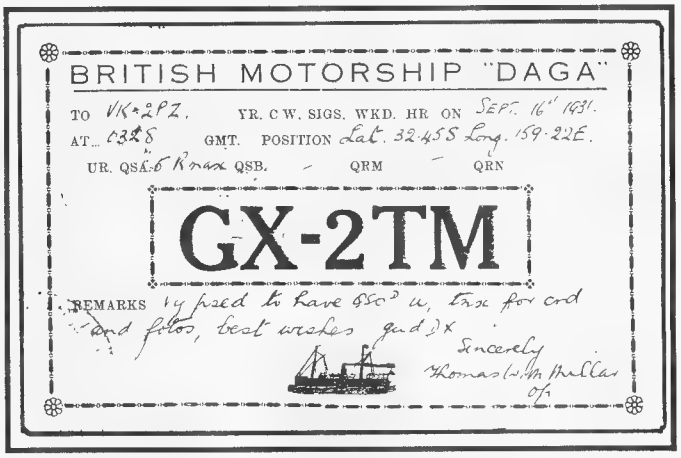
The advent of Single SideBand transmission revolutionised the world of amateur radio when it started to take the place of AM during the 1950s. The phenomenal advances in digital modes, not to mention satellite and SSTV activity, tend to eclipse this communication revolution. Just as some prefer CW, others prefer voice, so it is not surprising that amateurs have formed clubs to bring together others with their shared interest. The QSL, DF0SSB, is a special allocation to the Rodgau group of SSB operators who proudly display the special suffix of their callsign.

Card donated by Milton VK3MN.

VE3RCMP

The Royal Canadian Mounted Police (formerly the North-West Mounted Police) was given its present name in 1920 when it became responsible for the





enforcement of law throughout the whole of Canada. Amongst its many duties it is responsible for the suppression of trade in narcotics and also deals with smuggling offences. This body also enforces provincial laws in most of the Canadian provinces. The QSL card VE3RCMP celebrated the centennial of the force. Four letter suffixes are still fairly uncommon although Canada again used one for its Expo 86 with the callsign VE7EXPO.

The attractive QSL was donated by Roy VK4NE.

GX2TM

At first glance one would believe this QSL to be one of the GX prefixes recently allocated to English clubs operating under the same conditions as stations to which special event callsigns have been allocated. Actually, during the pre-World War II years we find several callsigns accompanied by the letter X. These were for operation as licensed portable stations. The callsign XYI6BZ portable from Iraq was featured in the November 1990 issue of *Amateur Radio.* The QSL GX2TM, dated 16 September 1931, was station G2TM operating fixed portable on the British motorship "Daga". In most cases the "X" was handwritten but in this case the operator must have felt that the frequency of QSL demand warranted the printing of a special card. It was for a CW QSO from the ship's "spark" to SK VK2PZ, Chris Cowan of Aberdare near Cessnock NSW.

Card courtesy of Bill VK3XT.

VI4MOO/VI4BEF

This special event QSL celebrated Australia's 1994 beef exposition in Rockhampton, radio operations taking place from 18 to 23 April. With the greatest concentration of cattle in Australia within 300 km of Rockhampton, Central Queensland, the city of 60,000 has earned the title of "Beef Capital of Australia". More than 500 international visitors, representing 100 countries, visited the city during the week of the exposition. Both of the callsigns VI4BEF and VI4MOO are probably as close as one can get to beef and a bovine exclamation.

Cards donated by Roth VK3BG and the Central Queensland Branch of the WIA.

LZ40KSL

Very few countries can rival Bulgaria in its use of multiple numericals in its allocated callsigns. The WIA national collection holds QSL cards with the prefixes LZ13, LZ30, LZ40, LZ90, LZ91 and LZ100. No doubt there are several more. The QSL LZ40KSL celebrated 40 years of the Socialist Revolution in Bulgaria from 9 September 1944. It was on the 5th of that month that the Soviet Union declared war on Bulgaria which, in turn, led to the Communist Fatherland Front party seizing power and declaring the Revolution. Bulgaria did not become a People's Republic until two years later after much internal unrest.

Card donated by Athol VK3CP.

Thanks

The WIA would like to thank the following for their kind donation of QSL cards to the collection (supplementary list):-

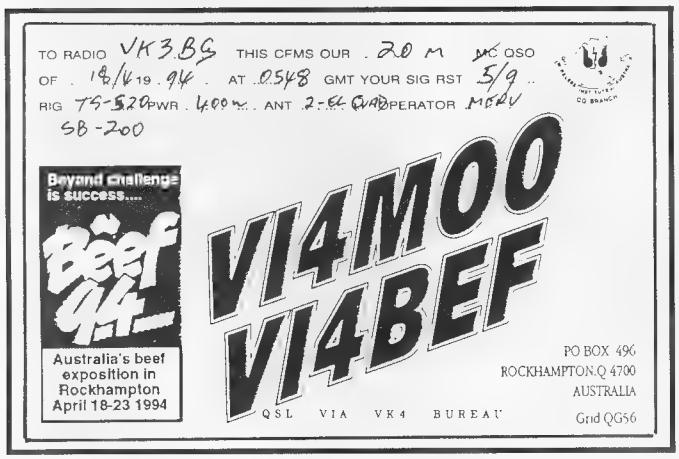
Tad VK3UX, Bob W5KNE, Mike VK6HD, Paul VK5MAP, Ken VK3MBO, Jim VK9NS, John N3GNF, Wim SP5DOJ and Jan SP5NE.

Also the following families and friends of the following "Silent Keys" (supplementary list):-

Jim Pope VK3DPO, Ray Humphreys VK3WO, Norman O'Brien G3LP, Henry Person VK4NRF and Harry Small VK2CAJ.

4 Sunrise Hill, Montrose VIC 3765 Tel (03) 728 5350

ar



Repeater Link

*Will McGhie VK6UU**

With so much happening and about to happen in amateur radio this year it is difficult to know what to comment about in the repeater scene. The time delay between writing this and its appearance in *Amateur Radio* can result in embarrassment to the writer. March is the new date for the new regulations to come into force and, in particular, the long promised change to the repeater regulations. This means that, along with this *Repeater Link* article you could also be reading the new regulations.

Community Benefits

The large increase in licence fees is leading me to believe that we are seen as a source of revenue. I thought that we were a little more than this. Our interest and efforts in communications technology flow back into the community and in many cases our work situations. For myself this is not just hollow rhetoric. My interest in amateur radio has benefited my work situation considerably. Working in the television industry and, in particular, outside broadcasts, brings lots of technology into one area. My particular work situation is microwave links and communications.

You probably are not aware of the complexity and enormous amount of equipment that goes into bringing you your favourite sport live. The television picture almost always is carried on a microwave link from the event back to the television station from where it is fed into the network. Often the outside broadcast site is not in direct line of sight to the television station. Being microwave the signal must have line of sight and be a strong signal with no introduced link noise into the picture. For an RF bandwidth of 40 MHz this requires several hundred microvolts and preferably signal levels over 1 millivolt. One or more microwave repeater sites have to be set up if there is not direct line of sight. Reliability has to be 100%. How often do you see a live outside broadcast fail due to the link failing? It just is not allowed. However, being electronic, it has to fail some time. The way around this potential loss of your favourite sports program is dual link systems. If one system fails then the other link is automatically selected and hopefully you did not even notice any disruption.

The point about all this is that most of my knowledge came from being interested in radio. It was not learnt at a technical college but out of my hobby interest in communications. Radio frequency technology is a bit of a fringe technology even in the broad area of television. Most technical people who work with and maintain television equipment shy away from radio. It was not covered in all the courses I did, and I did many. It is a specialist area. You either were into radio and microwaves or you were not. Television technical staff who found themself working with radio often never really figured it out. Sure, you could wander through and make do, but when it came to quickly figuring out an RF problem the person with the interest always performed better.

Now I might be in a small minority in that amateur radio directly benefits my work. I can pay the new licence fee, as it is not a large sum of money, but the whole situation alarms me. By the time you read this there may have been many changes but in my 27 years as an amateur I have never seen amateurs so upset. Packet radio has led the way in allowing us to gauge the opinions of other amateurs and to voice our own. Amateurs vary greatly in their ability to put words on to paper in a strong coherent manner. Reading other amateurs' point of view helps shape our response and we are able to make a better contribution.

QSP News

The "Golden Antenna" of the Town of Bad Bentheim

Every year, on the occasion of the German-Dutch Radio Amateur Festival (DNAT), the Town of Bad Bentheim awards the "Golden Antenna" to radio amateurs for an exceptional humanitarian deed in the field of amateur radio communications. This award has been given since 1982 to radio amateurs from countries such as Brazil, Italy, Belgium, Netherlands, Romania and the former USSR.

The "Golden Antenna" 1994 has been awarded to Rolf Sigrist DJ2RN. Beside many other worthy and unselfish activities, with the help of amateur radio he saved a family with four children from serious trouble in Uganda (Africa). Furthermore, by his radio contacts and personal involvement, he created the preconditions to building a new school in Uganda.

The 14th award of the "Golden Antenna" is to take place on the occasion of the 27th German-Dutch Radio Amateur Festival, on 25 August 1995 in Bad Bentheim.

Radio amateur organisations all over the world, as well as every radio amateur and every individual who have been helped in any way by radio amateurs, are called upon to submit proposals for individuals or groups of radio amateurs, handing in the respective detailed documents substantiating their proposal by 15 June 1995, at the latest, to Stadt Bad Bentheim, PO Box 14 52, D 48445 Bad Bentheim, Germany.

The Mayor of Bad Bentheim presenting the 1994 Golden Antenna award to Rolf Sigrist DJ2RN.

Repeater Licence Costs

The new fee structure as it relates to repeaters is alarming. The increased annual cost of the licence fee for established repeaters, and the rumoured large increase for new repeater sites, raises the question just what does the SMA do? Our local repeater group in VK6 manage several repeaters and have an annual licence cost of around $550. This figure is now set to almost double. The introduction of high powered pager transmitters so close to our prime VHF band has demonstrated that we have little protection from other services. Most of the interference to our 2 metre repeater network is not the result of faulty pager transmitters but repeater receivers being unable to cope with very strong signals. Many of these receivers are built to commercial specifications yet, with the signal levels received from pagers, are pushed into intermodulation. The result is loud pager audio.

The SMA and Repeaters

This invites the question as to what rights do we have from strong pager signals overloading our repeater receivers? I have been involved with several pager problems and have found the SMA courteous and helpful when contacted. The SMA officer is helpful in trying to localise the problem and supply information as to where the pager transmitter is located. But when it comes to actually fixing the problem it can become difficult from this point on. Pagers create a unique problem in that not only are they strong signals but they are very close to our 2 metre band. Also pagers are not just one transmitter.

In VK6, and probably in other states, when a pager transmitter keys up it is not necessarily just one pager transmitter that keys up, but several. The pager customer may have the wide coverage option and pagers several hundreds of kilometres apart all simultaneously key up. The result makes sorting out the pager problem very difficult. The SMA officer may find it far more difficult to find a solution to the problem than the repeater manager.

Almost all the pager problems experienced with repeaters in VK6 have been sorted out by amateurs. This is perhaps the best course of action as it is not possible for the SMA to sort out a problem with your repeater receiver in a cost effective manner. No one wants the SMA to be involved at this level but the question is, what do the SMA do when it comes to solving pager problems to our repeaters? My experience is that, helpful as they may wish to be, there is little the SMA can do.

For example, a pager problem with one of our repeaters was solved by us amateurs by shifting frequency. Many months of trying to solve the problem resulted in defeat and a frequency change was the easiest way around the problem. If you can't change frequency then you do have a problem.

VK3PK

My thoughts on the SMA's role in repeater management in Australia were further stimulated by a packet I read from Lee VK3PK. Now Lee had a lot to say about the role of the SMA on administering repeaters. What Lee's qualifications are to comment on this I do not know but so much of Lee's packet said what I have pondered over for many years. Repeater experimentation has been stymied from day one. Regulations that, to me, do nothing but restrict. It is acceptable to restrict something if there is a good reason, but when you try and try to figure out why a particular regulation exists, and can come up with no logic to it, then you have to ask is there something fundamentally wrong?

The conclusion of Lee's very lengthy packet was, let the WIA do most or all of what SMA now do towards repeater management. The WIA already do about half of the current repeater management in terms of frequency planning and coordination. The stumbling point appears to be the interface with other services. The SMA are reported to run the repeater frequencies through a computer program to check for problems to other services. I don't know if the SMA also check for interference to repeater receivers. If they do why do we have so many problems with pagers? One answer could be that the problem with receiver intermodulation is too complex for the computer program. Intermodulation problems can be the result of several sources and, to take all but the most likely, may just be too difficult.

Also included with Lee's comments was the pager problem with VK3RMM at Mt Macedon. I gather that this repeater is almost unusable due to pager interference and has been for many months. All attempts to fix the problem have had no effect. The repeater is not at fault, I gather. I know there are several repeaters in a similar situation throughout Australia.

UHF 828s

I received an informative letter from Colin VK3BLE several months ago and have only now been able to include some of it in *Repeater Link*. Colin is involved in repeaters in a big way in the Gippsland area in Victoria. He lists some twelve amateur repeaters, seven CB repeaters, two St John Ambulance repeaters and two Surf Lifesaving repeaters that he and other amateurs are involved with. The two clubs are the WIA Eastern Zone ARC and the East Gippsland ARC. I'm interested to know more about how all this came about Colin and, in particular, the involvement by amateurs in the non amateur systems. This type of involvement is what needs to be brought to the attention of our politicians and the SMA. Amateurs contribute to our community but does anybody know?

Colin's main reason for writing was a warning on the plastic inside the L1, L2 and L3, etc of the Philips UHF FM 828s being susceptible to melting. If you have to remove these coils for modification place a wet cloth on the metal cans then unsolder the cans only and remove them as one piece. Then unsolder the coils. If you damage the plastic which tunes the coils you may have difficulty in finding any replacements. Thanks Colin for the information and advice.

*21 Waterloo Crescent, Lesmurdie 6076
VK6UU @VK6BBS

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

P J (Peter)	KOEN	L50242
R T W (Ronald)	PAIN	VK1WP
N R	MARTIN	VK2AID
K (Keith)	JAMES	VK2CKJ/VK2KVQ
M	BARRY	VK2IH
J (John)	LLOYD	VK3AKF
C (Cliff)	MANNING	VK3CJ
H (Howard)	AMOR	VK3RD
L D (Lew)	FAVILLA	VK5BI
T	LAIDLER	VK5TL

Ronald Timothy Wellesley Pain VK1WP

Ron died at his home in Holt, ACT on 12 January 1995 aged 78 years. Upon completion of his education at The King's School, Parramatta in 1933 he studied accountancy and joined the Militia part-time. At the outbreak of WW II he enlisted (NX180) and served in 6 Div and 9 Div Signals in England and the Middle East. He was one of the "Rats of Tobruk."

Returning to Australia he was CI at the Signals Schools at Bonegilla and in PNG, rising to the rank of Major. He then transferred to the British Army serving in India and Malaya rising to the rank of Lt Colonel. Back in civil life he successfully manufactured Mellolite Venetian Blinds until taken over by Hunter Douglas. He then set up another firm making Aluminium Windows (Dayview). During this period he served on the Council of his old school, The King's School; two terms on the Hornsby Shire Council; member of Hornsby Rotary and a member of the Synod of the Diocese of Sydney.

From childhood he was actively involved in his local Church and upon retirement he spent four years in PNG for the Asian Pacific Christian Mission. While in PNG he gained his amateur radio licence, firstly as P29NRP in 1976 and P29RP in 1978.

Returning to Australia he settled at Coomba Park, near Forster, building his own home. While in NSW he used the callsign VK2DBH. In 1988 he moved to Canberra and was given the callsign VK1WP. One of his interests which helped to keep him fully occupied was putting on computer disks Pacific Native Languages (about 15 in all) for the Bible Society.

He is survived by his wife, Margaret, four children and twelve grand-children.

A. Franklyn Pain VK2DYP

Dr Michael Barry VK2IH

Mike Barry passed away on 14 January after a short illness, aged 81. He grew up in Strathfield and went to Sydney Grammar School. From there he studied medicine at Sydney University and graduated in 1938 as MBBS.

At the outbreak of WW II he was Medical Superintendent of Sydney Royal North Shore Hospital. At the time, this was a reserve occupation. However, Mike found the AIF was short of MOs and enlisted. After some time in the Army he was able to transfer to the RAAF and saw active service in Borneo.

In 1941 he married Lorna who also studied medicine. Upon discharge from the RAAF in 1946 they set up a joint practice which in those days meant house calls day and night.

From an early age Mike was fascinated with radio, but was unable to spare the time until he and Lorna retired in 1979. They moved to the Central Coast where he joined the local radio club and, with club members and friends, built his own SSB transceiver. He really enjoyed his radio.

We offer our condolences to his wife Lorna, two sons Michael and Patrick, and grand children. Farewell dear friend, Happy to meet — sorry to part.

Les Gaborit VK2LW

Have you advised the WIA of your new Callsign? Use the form on the reverse side of the Amateur Radio address flysheet.

Lewis D Favilla VK5BI

It is with deep regret we report the passing of Lewis (Lew) D Favilla VK5BI on Monday, 2 January 1995 aged 85. He had only recently been made our first Life Member. His cheery voice will be missed by his many friends on air.

Lew took up amateur radio at the ripe age of 80 years, obtained his Novice licence at 81 years, and followed through to obtain his Full Call some months later. Quite an achievement for an octogenarian!

Lew was proof that you are never too old to take up a new hobby and enjoy it and life to the fullest. 73 Lew.

John C Vayne VK5BL
Moonta Scout Group ARC

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Pass Band Tuning for The ICOM IC-751A

Recently I bit the bullet and decided to trade in my much loved Uniden 2020 transceiver for a more "state of the art" ICOM IC-751A.

Having installed the new rig and operated it over a period of several months I was disappointed to find that the IF shift, the notch and the filter controls were virtually useless.

By comparison, the ICOM IC-R71E communications receiver which I use for general shortwave listening left the new transceiver for dead. So what's the joke, I thought to myself. I spend several thousand dollars and get a rig with a handful of controls that look beaut but do nothing. Being completely satisfied with the ICR-71E performance I decided to compare the circuits and see what differed.

Surprise, surprise! All that had changed was an extra transistor in the IC-751A circuit which, if anything, seemed to serve only to cut off the pass band tuning function.

"This transistor must go", I thought!

After tracking it down the offender was duly excised.

The difference in performance which resulted from this modification is almost unbelievable.

Why ICOM have made such a circuit change is more than I can understand. Indeed, I find nothing good to say about the IF shift control except that in theory it seems OK. In practice, it leaves a lot to be desired.

The Modification

1. Disconnect power from the rig and then remove the upper half of the transceiver case.
2. Locate the shielded enclosure which is approximately 10 centimetres from, and immediately to the rear of, the tuning control knob. This enclosure is identified by a coil adjustment hole in its lid.
3. At the left hand side of this enclosure are two transistors. The one of interest is Q87 (RN2202), Q87 being marked on the PC board beside the transistor.
4. Depending on how adventurous you are you may try either of the following:
   (a) Take out the Main Board retaining screws, lift up the PC board and desolder Q87 and remove it; or
   (b) Carefully snip the transistor's three legs using an appropriately small tool. Make sure remnants of the legs are separated and that they are not in contact with the shielded enclosure or any other component.
5. The IF Shift now operates as a Pass Band Tuning system. Both the Notch and the Filter controls exhibit greatly enhanced functionality.

Steve Bushell VK3HK
20 Allendale Crescent
Mulgrave VIC 3170

VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

Six Metres

Six metres almost let us down this year. There were several good bursts during November, then a few quiet periods until Christmas. From then on through January the band has been very responsive with interesting long haul contacts across the continent and to New Zealand. Short skip conditions have produced quite a number of good, though relatively short, openings on two metres Es from VK5 to the eastern states and VK7.

Mike VK2FLR said that, from the Sydney viewpoint, the Es season got off to a good start in December but went into decline towards the end of the month. Things picked up again in January with some very widespread openings on six and a number on two metres. On 13-14 January VK1, 2, 3, 4, 5, 6, 7, 8, ZL and FK8 were all available in Sydney on six. He did not hear VK0IX although it was reported that VK2BA had done so. On two metres during the first half of January VK5 was worked from Sydney on at least three occasions, New Zealand once, plus FK1UH and FK8GM from New Caledonia for 30 minutes on the evening of the 15th.

Roger VK5NY said that on 15/1, after the VHF/UHF Field Day had ceased, from 0621 he had two metres Es and worked VK1VP, VK1BG, VK2ZXC and a partial contact to VK2DXE. 0740 VK7ZIF on six metres with VK7RNW/b on two metres warning that the band could be open. From 0747 to 0759 Roger worked VK7ZMF, VK7ZIF, VK7XR and VK7KAP. VK7ZIF was rather pleased as it was his first VK5 contact on two metres. Roger was told that he had just completed working all available VK7s who operate on the low end of two metres! The two metre signals were not strong so tropo may have been involved. At 0804 Roger worked VK3BEH, and at 0806 VK3BRZ. Then on six metres at 0839 ZL3NW followed by ZL2IA. It was a good weekend.

10 GHz

Following the recent world record-breaking contact between Roger VK5NY and Wally VK6KZ, Wally took the opportunity of using the e-mail system to pass on the good news to the world microwave fraternity. Wally sent me copies of his messages and the responses and the world scene is certainly agog with interest.

The response from Chip Angle N6CA was particularly interesting — I quote portion. *Every summer we attack with Paul Lieb across the pond* (California to Hawaii....5LP). *Last year we finally made it on 2304, all previous attempts had no propagation on 2304. 3456 and 5760 were quite exciting when they happened. 10368 MHz is going to be the most difficult. We have been trying on all of the bands (902, 2304, 3456, 5760 and 10368) every year now for the past four or five years.*

Equipment, which is identical on both ends of the path is: four foot dish, .375 F/D with changeable feeds for 2304 thru 10368. KH6HME's feed lines are about eight feet of 1/2 inch hard line. On 10368 he uses seven feet of WR90 waveguide, 0.6 dB loss.

On my end, 30 inch feedlines (1/2 inch) and four feet of WR90 guide. 2304-12 watts 1.5 noise figure receivers; 3456 — 7 watts, 1.5 nf Rx; 5760 — 5 watts, 1.5 nf Rx; 10368 — 3.5 watts, 3 dB nf Rx.

We are probably going to upgrade Paul's system on 10368 with a TWT, a new receiver and a new feed so we can go up to 15 watts, 1 dB nf and a new Chapparall feed from TVRO Ku band.

Congratulations again on yet another fine effort in pushing the rest of the world! 73's. Chip N6CA.

As Wally VK6KZ says, Australia has the record for at least the next six months until the northern summer when it may be lost to the California — Hawaii path. Let's wait and see, it may not be that simple! In the meantime it would be nice to see VK raise the distance to at least 2000 km. Just imagine if it became Albany to New Zealand, about 4500 km!

Ross Hull Contest

Chris VK1DO commenced operation in the contest from a field location late on 26 December. Conditions were not favourable and the 24 hours in the field yielded only 28 contacts on 2 m, 70 and 23 cm. The exercise served to test some equipment and antennas for the forthcoming field day contest. The remainder of the Ross Hull saw quite flat conditions with the usual spread of VK2 and VK3 stations on 2 and 70.

Chris writes, *The new rules for the Ross Hull have been well received and the emphasis on the 100 best contacts per band has relieved the congestion created by local stations exchanging numbers. As an operator who rarely scores annual leave over the contest period I would like to suggest a notation on entries from those who continued to work full time (that includes Saturday for me.) This is not an exercise in sour grapes but an opportunity to compare ourselves with similarly placed stations.*

I am concerned that there may be an inclination on the part of some people to eschew contests, fearing that there might be an excessively aggressive or unfriendly atmosphere prevailing. The principle intent, surely, is to provide activity and stretch your operating horizons. As an operator who grew up with HF contests and now mainly operates in VHF contests, I would assure anyone who abhors aggressive or unfriendly operating techniques, that the most serious rivals are often heard assisting one another in the completion of contacts on difficult bands and paths. The courtesy and consideration shown between VHF operators abounds during a contest and will always be an excellent medium for new operators and old hands to co-exist (I couldn't agree more...5LP).

During the VHF Field Day on 14/15 January, Chris VK1DO, Andrew VK1DA, Geoff VK1CO and Bill VK2IFR mounted a combined effort at Kowen Forest northeast of Canberra and 1000 metres asl. The location chosen placed particular emphasis on 23 cm and hoping to work Doug VK4OE near Narrabri. The increased manpower made easy work of erecting the station with a professional operating room kicking off close to starting time with 6 metres open to ZL. This band continued to provide good contacts throughout Saturday until sunset and again on Sunday.

Conditions towards NE Victoria were rock solid; however, in the Melbourne direction we clearly had an impeded path. Despite the fairly difficult conditions in an important direction, Roger VK3XRS and Rob VK3DEM were worked on 23 cm. Late in the evening we made contact with Doug VK4OE who had found things pretty slow until then. Numbers were exchanged on 2 and 70 and numerous attempts were made for 23 cm with Doug audible to us but our lower power not making the grade in return.

Next morning signals from Doug were very favourable on 2 and 70 and the 23 cm contact on phone was completed fairly easily. This contact exceeds the record set with VK2DVZ in 1993. The distance and record set are yet to be confirmed; however, the considerable effort and travel for Doug is to be commended.

The station at VK1DO/p on 23 cm consisted of 4 x 36 element Yagis, MGF1302 preamp and a Kenwood TS790 running about ten watts. A thoroughly enjoyable field day completed with minimal fatigue and in excellent humour.

Doug VK4OE writes about his activities during the Field Day, some of which are already mentioned in the report from

VK1DO. He went to his usual portable location on Mount Kaputar near Narrabri and enjoyed being part of the VK2/4 record contact on 23 cm with Chris VK1DO over a distance of approximately 600 km (see above). Doug used 50 watts with the Tx amp and Rx pre-amp both mounted at the feedpoint of four loop Yagis (see front cover of December 1994 *Amateur Radio* for photograph).

Best 144 MHz contact was with VK2TWR/p at Snowy Mountains, 760 km. Many Sydney area stations were good strength on 144 and 432 MHz, also three central NSW stations west of Dubbo — VK2FC, VK2EMA and VK2XCI, each in a different grid square. He also worked Lyell VK2BE 5x8-9 on 1296 MHz. Signals between VK4OE/p and Brisbane were unexpectedly weak, probably due to the New England Plateau intervening.

Like so many of us who have been involved in portable operation, Doug looks forward to the occasion when the VHF/UHF Field Day will coincide with a slow moving high pressure system in the right spot and many only-dreamed-of contacts will actually occur in the eastern part of our continent. He thanks the Sydney-based fraternity for their fostering of some activity and enthusiasm for VHF and UHF amongst a number of amateurs in western NSW.

On 23/1 when Gary VK4AR, Peter VK4APG and Rod VK4KZR, all in Brisbane, began their usual aircraft enhancement contacts with Gordon VK2ZAB they found signals were a steady S5 and did not diminish. Rod also worked Gordon on 432. As the signals experienced slow QSB and peak characteristics indicative of long distance tropo enhancement, they turned their attention further afield and on 144 worked Gary VK4ABW/2 at Glenbrook in the Blue Mountains west of Sydney and Bill VK2IFR at Cooma, the latter at about 1050 km. Doug VK4OE was advised and worked VK2IFR for half an hour with signals at S2. No VK1s were heard.

Doug VK4OE enclosed a weather map from the Brisbane Weather Bureau which showed an eastward moving 1028 hP high in the southern Tasman Sea. The trailing edges of this high included the area between Brisbane and south of Sydney which is a classic example of the conditions required for tropo enhancement. This is one of the reasons why VK5LP and others like to see the daily weather map on television because it tells a story in itself as being one of the factors which may lead to a warning of long distance propagation.

The Antarctic — Again!

The continent of Antarctica, which for years remained "too difficult" for six metre operators to work, or so we thought, has proved to be more accessible than ever imagined. All that was required was someone to be available to operate from the Antarctic and for amateurs elsewhere to be dedicated enough to make the effort to respond. The first definite such response came in November 1993 when Steve VK3OT was instrumental in spanning the distance of 3750 km and being the first ever to work VK0 on six metres by working VK0AQ. He was quickly followed by VK3LK and VK5NC and together they formed an exclusive club of three to have worked there on six metres.

Since then the club has extended to more than 30 members with the addition of Melbourne stations, more VK5s and VK7ZMF on 31/1. The following info is a mixture of that supplied to me by Steve VK3OT and notes from my log book, and commences on 13/1/95 at 0730 with the VK0IX beacon varying from 319 to 519 with rapid QSB, plus VK6ZAK, VK6JJ, VK6AS and FK1UH heard. From that which follows, readers can see how a chain of events unfolded at VK3OT leading to a possible contact warning being issued.

0731: Worked VK6JJ, VK6ZAK.
0740: TV video and sound on 45/46/50/51/57/62/64/69 MHz.
0745: Beacons on 50.042/056/057/076, 52.325/345/420 MHz.
0746: VK0IX/b 539 fast QSB.
0755: VK0IX called on 50.110 and heard unidentified CW.
0800: Video 45.240/250/260, 46.2396/2400, 55.2396, 57.240/26035/2607.
0801: Video 62.2396/240/2502, sound 62.760.
0802: Video 64.240/250/260, sound 69.740/750.
0805: FM sound 80.070, 90.105, 91.820, 94.660, 96.320, 97.080.
0810: VK0IX/b back and faded out within two minutes.
0845: VK6ZAK heard.

The above set of circumstances was sufficient to alert those interested so some stations were ready the next afternoon, 14/1. It was also the first day of the VHF/UHF Field Day so more stations were on air. Much TV video below and above 50 MHz, six metres to everywhere, two metres Es again to VK2 and VK4, ZLs were in and so were the VK7 beacons, the early afternoon pointers were right. The only problem seemed to be the impending storms, gale-force winds, dust, then thunderstorms. Pity!

The beacon did not get to me on 13/1 but on 14/1 I was on the alert from 0600 after the huge storms and lightning had subsided — all antennas were disconnected here from 0300. At 0730 VK7RNW/b was 599, at the same time VK4BRG/b was 579. VK0IX/b was heard here from 0745 through to 1100 at 519 at which hour it commenced to improve. Soon after, we managed to get Darin on air and I worked him 5x2 at 1135. At 1140 he was 5x6 for about five minutes but I resisted the temptation to work him again in case I spoilt it for someone else. Darin then slowly dropped down until disappearing around 1155.

14/1/95 as supplied by VK3OT:

0608 VK2BA in Sydney copied VK0IX/b weakly (4471 km).
0633: Beacon into Sydney again. VK2BA alerted people on 6 m.
0645: VK8LM, VK8VF/b, VK8AH, (2500 km), VK1DO short skip.
0730: VK0IX/b to VK3OT, alerted stations.
0750: VK3OT CW copied in ZS1 via South Pole (details being checked.)
0755: VK0IX copying 55.250 video from ZL and sound carriers from VK.
0759: VK7ZIF short skip S9+.
0800: **VK3OT made two-way 5x5 SSB QSO to VK0IX (3750 km).**
0802: VK2QF Mudgee worked VK0IX 5x1 (4544 km).
0808: VK5ARC/p copied VK0IX/b weakly.
0820: VK2BA hearing beacon again, also at 0844.
1105: VK0IX/b heard weakly in Adelaide (3934 km).
1134: VK5ARC/p worked VK0IX 5x1 (who by now was very stable), followed by VK5PO/p, VK5NY, VK5LP, VK5ZTX, VK5ZIP, VK5ZTV, VK5ZWI, VK5ZBR, VK5UBJ, VK5ZBK and VK5GRS.
1145: VK3OT heard VK0IX on CW but no QSO.
1155: Band closed. (The list of stations actually worked by Darin VK0IX on 14/1 has been confirmed by receipt of a Fax from him listing the stations.)
15/1/95: Band opened to ZL at 2200 with TV on video and audio frequencies. Call signs and beacons logged up to 0200: ZLs 2TPY, 2KI, 2UJH, 3NE, 3TY, 1THQ, 1AXB; VKs 3DTO, 3DUT, 3DUQ, 3ATQ, 4DO, 4BRG, 4EZ, VK7FP/mm etc. ZL3MHF/b 50.043, ZL4AAA/b 50.097, ZL2MHB/b 51.028, VK4BRG/b 50.076, VK4ABP/b 52.345, VK7RST/b 52.370 from 0300 short skip.

0700: VK5 to VK3 strong opening.
0700: VK1RX worked VK0IX 5x1 (4256 km).
0830: VK2BA et al to FK8 on two metres.
25/1: 2300 FO5DR using FM heard in VK2, 3, 4.
26/1: ZLs all day. Short skip VK2 to 3, VK7.
0700: TV on 49.750, VK5BC on backscatter.
0730: VK0IX/b 539 using TS660 connected to 50 metres of RG58 and beam on Brisbane!
0745: VK0IX/b 50.200 559 with fast fading.
0920: Beacon off and VK0IX calling CQ on 50.110 — VK3OT 5x1/5x2 exchanged in QSO. VK5NC and VK5LP hearing beacon 519 at 0830. No copy in ACT or Melbourne. VK5LP alerted VK5RO, VK5BC, VK5AKM, VK5NY, VK5KK.
27/1: 0835 VK0IX/b 529 at VK5LP. Alerted VK5AKM and VK5BC.
29/1: 1011 to 1021 VK0IX/b 519 heard by VK5NY, VK5LP and VK5ZBR.
31/1: 0904 VK0IX/b into Melbourne. 0937 to 1145 worked by many VK3s, VK3OT, VK5LP, several more VK5s and VK7ZMF. Signals were up to 5x7.

The VK0IX beacon has been received over a wide area covering VK4AFL in Brisbane (5195 km), VK2APG and VK2BA Sydney area, VK2QF at Mudgee, VK3OT Hamilton, VK5LP Meningie, VK5NY Mount Wilson, Adelaide stations and VK1RX in Canberra, with no Melbourne stations in the first instance, but fortunately they were rewarded on 31/1. It's odd that there are no reports of any contacts from VK6 — Perth is 3833 km from Casey. They have been alerted.

VK0IX/b was heard in VK5 on seven days during January! The mode of propagation is difficult to define with any certainty. It appears that weak beacon signals arrive around local sunset then gradually increase in strength, sufficiently to allow SSB operation. On 31/1 Melbourne stations had contact before Adelaide but it soon was open to both areas simultaneously. Signals in Adelaide rose to S7. The Tasmanian beacons were very strong during the opening suggesting some Es content but the VK0IX signals are usually steady with occasional small fades so there may be some tropo component. Very interesting.

VK0IX uses a 50 metres per leg V-beam pointing to Adelaide connected to an ICOM 575H running 100 watts. He has access to a three element beam. He also uses 14.335 MHz. The beacon operates on 50.200 and Darin chooses his actual operating frequency usually close by but he can also be heard on 50.110 MHz. QSL route for VK0IX is Darin Roberts, care of John McRae VK5PO, 13 Francis Street, Kapunda, South Australia, 5373.

Western Australia

The West Australian VHF Group Bulletin for January provides a listing of the status of their beacons which has been added to my data base. Also included is a comprehensive list of satellite uplink and downlink frequencies. A notation says that, *All satellites up to and including AO-9 have crashed. UO-14 has been returned to the University of Surrey for Medical Research. UO-15 failed after a few orbits. RS-15 was launched on 26 December 1994. AO-21 was recently switched off by the main control centre for the Russian space centre as the mother satellite was no longer required. The RA-24 failed after several months with low battery voltage switching in to a 2 metre transmitter which has no antenna. PO-28 is currently only in use by the satellite owners transmitting on non-amateur frequencies.*

Delayed News

Mike VK2FLR sent me a Fax in November which never arrived but I now have another copy. It includes references to stations in country areas of NSW which should be within tropo range of VK5s, so please note!

The weekend two metre and 70 cm circuits continue between stations in Sydney, Canberra and country NSW. For Gordon VK2ZAB this list should be extended to include VK4 and VK3. NSW country activity includes the tireless Ross VK2DVZ at Taree who consistently works into Sydney and occasionally Canberra on 23 cm. In the west are VK2YZU at Peak Hill, and VK2EMA and VK2ERB at Condoblin. Mark VK2EMA now has two 17 element Yagis for 144 and added a couple of S points to his signal into VK2FLR in Sydney. Mark reports good reception of sun noise with the new array.

In the south west, VK2BWT and VK2APP at Young are typically S5 to S7 or better into Sydney. Further to the south are newcomers VK2TWR at Nimmitabel and VK2TCL at Captains Flat, east of Canberra, the latter having now discovered the virtues of horizontal polarisation.

In Sydney there are the regulars, plus Norm VK2ZXC who occasionally shows up from Port Kembla. Newcomers in Sydney are Brad VK2ZBD and Mark VK2GFR.

Mike's letter also includes information on meteor scatter tests, plus the use of digital processing devices (DSP). I need more space so will carry these items over until next month, together with overseas news.

Closure

March will see the approach of the equinox so TEP activity with Japan and other northern neighbours may increase.

Closing with two thoughts for the month:

1. A well-adjusted person is one who makes the same mistake twice without getting nervous, and,
2. A folk singer is a person who gets rich singing about how wonderful it is to be poor.

73 from The Voice by the Lake.

**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: to VK5ZK for VK5LP

ar

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5001
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for five of the bands between 7 and 28 MHz. The UTC hour is the first column; the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μV (dBU) at the MUF; the fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point "standard" where S9 is 50 μV at the receiver's input and the S-meter scale is 6 dB per S-point.

V in 50 ohms	S-points	dB(μV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100 W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland.

VK SOUTH Southern-NSW, VK3, VK5 and VK7.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used in these calculations is 20.5. The predicted value for April is 18.7.

ar

VK SOUTH — SOUTH PACIFIC

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	18.1	15	15.1	-4	22	16	7	6
2	18.4	16	15.6	-3	23	16	8	5
3	18.4	16	15.4	0	23	17	8	5
4	18.4	17	15.3	5	25	18	8	-5
5	18.4	18	15.1	14	27	19	9	-5
6	18.2	20	14.7	30	31	20	9	-6
7	17.3	23	13.8	44	33	20	7	-10
8	15.8	25	12.5	48	31	15	0	-20
9	14.1	27	11.2	49	26	7	-10	35
10	12.6	29	10.0	49	21	-1	22	
11	11.7	29	9.2	48	16	10	34	
12	10.9	30	8.6	47	11	-17	..	
13	10.2	31	8.1	45	6	-25	...	
14	9.8	32	7.7	44	3	-30	...	
15	9.4	32	7.4	43	0	-35	...	
16	9.0	33	6.9	42	-3		...	
17	8.6	33	6.6	41	-8	.	...	
18	8.2	33	6.3	40	-13		...	
19	8.5	28	6.5	32	-9		...	.
20	10.3	21	7.7	23	4	-22		
21	13.0	18	9.9	12	14	-1	-18	
22	15.5	17	12.1	5	19	9	-3	-21
23	17.0	16	13.6	0	21	13	3	-12
24	17.6	16	14.3	-3	21	14	5	-9

VK WEST — SOUTH PACIFIC

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	21.6	12	17.5	-34	17	17	13	5
2	22.1	12	18.4	-36	17	18	14	6
3	22.5	12	16.9	-34	18	18	15	7
4	22.5	13	18.8	-28	19	19	15	8
5	22.5	14	18.6	-19	22	21	16	8
6	22.5	15	18.4	-1	27	23	18	9
7	22.2	17	17.7	16	31	26	19	10
8	20.5	20	16.3	31	34	26	18	6
9	18.6	22	14.7	42	34	24	14	0
10	16.5	25	13.1	45	32	19	7	-9
11	14.8	27	11.7	47	29	14	0	-20
12	13.8	28	10.9	48	27	10	-6	-28
13	13.0	29	10.3	47	24	6	-11	-35
14	12.4	30	9.8	47	22	2	-17	
15	11.8	30	9.4	46	20	-1	-21	
16	11.4	31	8.9	46	18	-4	-25	
17	10.7	33	8.2	45	16	-7	-29	
18	10.3	33	7.8	44	12	-13	-37	
19	9.9	29	7.6	36	9	-16		
20	10.3	23	7.8	22	9	-12	-34	
21	12.5	18	9.9	7	14	0	-14	-36
22	16.0	15	12.2	-8	18	10	1	13
23	19.0	14	14.8	-21	18	15	9	1
24	20.9	13	16.6	-30	17	17	12	4

VK EAST — AFRICA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	11.2	10	8.2	-8	7	-6	-21	.
2	10.8	4	8.3	-21	5	-5	-18	-38
3	10.2	-2	7.8	-31	2	-7	-20	-39
4	12.9	2	9.8	..	3	0	-7	-21
5	17.6	6	13.6	...	3	6	3	-4
6	19.7	6	14.5	..	3	7	5	-1
7	19.9	6	14.7	..	3	7	5	-1
8	19.5	7	14.5	...	4	8	5	-1
9	18.3	8	14.4	...	7	8	4	-4
10	16.6	9	13.1	...	9	7	1	-9
11	14.8	10	11.6	-27	10	5	-3	-17
12	13.2	12	10.4	-11	11	2	-9	-27
13	12.2	15	9.6	2	12	-1	-15	-36
14	11.4	21	9.0	19	13	-4	-22	..
15	10.9	25	8.6	31	13	-7	-27	
16	10.5	28	8.2	35	11	-11	-33	
17	10.1	29	7.8	38	10	-14	-37	
18	9.6	31	7.3	39	7	-19	.	
19	9.2	31	6.9	38	4	-23	.	
20	9.6	30	6.7	39	7	-18		
21	9.4	30	6.5	38	5	-22	.	.
22	9.0	23	6.3	24	1	-24	.	..
23	8.8	17	6.3	15	0	-24	..	
24	9.5	11	6.8	2	2	-17	-37	.

VK SOUTH — AFRICA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	11.2	16	8.2	5	11	-3	-18	..
2	10.8	11	8.2	-6	7	-5	-20	...
3	13.6	11	10.8	-20	11	4	-5	-20
4	18.4	12	14.2	-39	12	12	7	-1
5	20.4	9	15.1	...	9	11	8	1
6	20.8	8	15.2	..	7	10	8	2
7	20.9	8	15.1	..	7	10	8	2
8	20.6	8	14.7	..	7	10	8	1
9	19.8	9	14.0	...	9	11	7	0
10	18.7	10	13.1	...	11	11	6	-3
11	17.1	11	11.9	-26	13	10	3	-8
12	15.3	13	10.6	-11	14	7	-2	-16
13	13.5	16	9.4	3	14	3	-9	-28
14	12.3	20	8.5	18	14	-1	-17	...
15	11.4	24	7.8	31	14	-6	-25	
16	10.7	27	7.3	35	11	-12	-34	
17	10.0	29	6.9	38	8	-17		
18	9.6	30	6.7	38	5	-22		
19	9.2	30	6.5	38	3	-26		
20	9.3	30	6.7	38	3	-25		
21	10.0	30	6.9	39	8	-17		
22	9.5	29	6.7	37	5	-21		
23	9.4	23	6.7	26	3	-21	.	.
24	10.2	18	7.4	15	6	-13	-34	

VK WEST — AFRICA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.9	21	7.5	20	6	-15	-37	.
2	10.3	15	7.9	5	8	-8	-26	...
3	13.1	14	10.4	-10	12	3	-8	25
4	18.0	13	13.9	-29	15	13	7	-3
5	20.5	10	15.7	.	12	13	9	2
6	20.9	9	17.2	.	10	12	9	2
7	20.9	9	17.3		9	11	8	2
8	21.0	9	17.1	.	9	11	8	2
9	20.6	9	16.7		9	12	8	1
10	19.7	10	15.8	.	11	12	7	0
11	18.4	11	15.6	-30	14	12	6	-4
12	16.7	14	13.2	-12	17	11	2	-10
13	14.8	16	11.7	3	18	8	-3	-20
14	13.2	21	10.5	22	18	3	-11	33
15	12.3	25	9.7	35	18	0	-18	
16	11.5	27	9.1	38	16	-5	25	
17	11.0	29	8.7	41	14	-9	31	
18	10.5	30	8.2	42	12	-12	36	
19	10.2	30	7.9	41	10	-16		
20	9.7	31	7.4	40	7	-21		
21	9.3	31	7.1	40	4	-25		
22	9.7	31	7.4	40	7	-20		
23	10.4	31	8.0	42	12	-13	36	
24	9.7	27	7.4	32	7	18	.	

VK EAST — ASIA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	26.2	13	21.4	...	19	22	20	16
2	26.2	13	21.3	...	18	21	20	15
3	27.2	13	20.9	...	18	22	21	17
4	28.1	13	23.4	..	19	23	22	18
5	29.3	14	24.0	...	21	25	24	20
6	28.6	15	23.3	-30	23	26	25	21
7	27.3	15	22.0	-15	27	28	25	20
8	25.4	17	21.4	9	32	30	25	18
9	23.4	19	18.7	34	38	31	25	15
10	21.2	20	16.9	41	37	29	20	9
11	19.2	22	15.2	45	36	25	15	0
12	18.1	22	14.3	48	35	22	11	-5
13	17.2	23	13.6	51	34	20	7	-10
14	16.3	24	13.0	50	31	16	2	-16
15	15.5	24	12.2	50	29	13	-2	-23
16	14.8	25	11.6	49	27	9	-7	-30
17	13.4	25	10.5	48	22	1	-18	.
18	11.6	27	9.0	45	12	-13	-38	...
19	10.9	27	8.4	44	8	-21	...	...
20	9.6	28	7.4	40	-4	...	.	..
21	13.9	21	11.0	32	20	2	-14	-39
22	21.5	16	16.8	0	27	23	17	7
23	23.8	15	19.1	-20	23	23	19	12
24	24.5	14	20.0	-33	20	22	19	13

VK SOUTH — ASIA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	19.6	11	16.0	..	13	13	9	0
2	20.3	11	16.8	.	12	13	10	2
3	20.8	11	17.6	..	12	14	11	4
4	20.9	12	17.5	.	12	14	11	4
5	21.0	12	17.3	..	14	15	12	4
6	20.9	13	17.1	-38	16	16	13	5
7	20.6	14	16.7	-25	19	18	13	4
8	19.6	16	15.7	-5	23	19	12	2
9	18.2	21	14.4	35	31	21	11	-3
10	16.5	22	13.1	42	30	16	3	-14
11	14.7	23	11.7	44	25	8	-7	-30
12	13.2	24	10.5	45	19	-1	-21	
13	12.4	25	9.8	45	15	-8	-30	
14	11.6	25	9.2	43	11	-15	.	
15	11.2	25	8.8	43	8	-20	...	..
16	10.8	25	8.5	42	5	-24	...	.
17	10.5	26	8.2	41	2	-29	...	
18	9.8	26	7.6	39	-4	-39	...	...
19	9.1	26	7.0	37	-12	...	...	
20	8.6	26	6.7	35	-20	...	.	.
21	11.3	24	8.6	38	8	-18	.	
22	14.6	15	11.3	2	16	4	-8	-27
23	17.5	13	13.7	-19	16	12	4	-8
24	19.1	12	15.2	-34	15	14	8	-1

VK WEST — ASIA

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	22.9	14	18.3	-29	20	21	17	10
2	23.6	14	19.2	-38	18	20	17	11
3	25.0	14	20.7	.	18	21	19	14
4	26.3	14	20.1		18	22	20	13
5	27.2	14	22.6		19	23	22	18
6	27.4	15	22.6	-39	21	24	23	19
7	27.3	15	22.3	-30	23	26	24	19
8	26.7	16	21.7	16	27	27	25	19
9	25.4	17	20.4	5	32	29	25	18
10	23.6	19	19.9	32	37	32	25	16
11	21.7	20	17.3	40	38	29	21	10
12	19.5	21	15.5	45	36	25	15	1
13	17.6	22	13.9	47	33	20	7	9
14	16.5	23	13.1	50	31	16	2	17
15	15.6	23	12.4	50	29	12	-3	-24
16	14.9	23	11.9	49	26	8	-8	-32
17	14.2	24	11.2	48	24	4	-14	-39
18	13.6	24	10.7	47	21	0	-19	
19	12.5	24	9.7	46	15	-8	-31	
20	11.0	25	8.5	43	5	-26		
21	9.5	26	7.3	39	-10	.		
22	13.3	23	10.5	41	19	-2	22	
23	17.9	16	13.9	3	23	15	6.7	
24	21.5	15	16.9	-16	22	20	15	6

VK EAST — EUROPE

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.5	-4	6.9	-27	0	-11	-26	...
2	8.8	-11	6.5	-33	0	-11	-26	...
3	9.1	-14	6.7	...	0	-9	-22	...
4	10.8	-9	7.6	...	0	-4	-13	-28
5	13.8	-2	10.4	...	-1	0	-5	-15
6	16.6	2	12.5		-2	3	0	-6
7	18.7	5	14.1		-2	5	4	-1
8	19.9	7	15.0		1	7	7	2
9	21.0	11	15.8		7	12	10	5
10	21.1	14	16.3		14	16	13	7
11	18.9	16	15.1	-20	19	17	12	2
12	17.1	18	13.5	-1	22	16	8	-4
13	16.0	20	12.7	14	24	15	5	-9
14	15.2	23	12.0	26	25	14	2	-14
15	14.4	25	11.4	35	26	12	-1	-19
16	13.8	26	10.9	40	25	10	-4	-25
17	13.2	28	10.3	43	24	7	-8	-30
18	12.2	29	9.4	42	20	1	-17	..
19	10.7	30	8.3	40	14	-9	-31	
20	10.3	30	7.7	40	11	-13	-36	...
21	10.3	28	7.2	37	9	-15	-39	..
22	9.3	21	7.1	19	5	-18	..	...
23	9.9	11	7.0	0	4	-14	-33	..
24	9.8	3	7.0	-17	2	-12	-28	.

VK SOUTH — EUROPE

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	10.4	4	7.4	-19	4	-8	-23	...
2	9.5	-4	6.8	-29	1	-10	-25	...
3	9.7	-9	7.1	...	0	-8	-20	...
4	11.6	-6	7.9	...	0	-2	-11	-25
5	15.0	0	11.1	...	-1	1	-2	-11
6	18.1	3	13.4	...	-4	3	3	-2
7	20.3	5	15.1	...	-5	4	5	2
8	21.5	7	16.0	...	-4	6	7	4
9	20.7	8	16.6		0	8	8	4
10	19.3	9	15.2	.	5	10	8	1
11	17.4	11	13.8	.	10	11	6	-3
12	15.5	14	12.3	-20	14	10	2	-11
13	13.9	17	11.0	1	17	7	-5	-22
14	12.9	22	10.2	20	18	4	-10	-31
15	12.2	25	9.6	32	18	0	-17	...
16	11.7	27	9.2	37	17	-3	-22	...
17	11.3	28	8.8	40	16	-6	-26	...
18	10.9	29	8.5	40	14	-9	-30	...
19	10.3	29	8.0	40	10	-14	-38	...
20	9.8	30	7.5	39	7	-20	..	..
21	10.1	29	7.6	39	9	-16	..	..
22	9.1	27	7.1	31	1	-27	...	..
23	9.2	19	7.1	18	1	-23	..	...
24	10.8	13	7.5	-1	7	-8	-24	...

VK WEST — EUROPE

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	11.0	15	7.7	6	8	-9	-26	..
2	10.0	4	7.1	-13	1	-13	-31	.
3	10.1	-1	7.3	-28	0	-11	-26	..
4	12.2	-1	8.2	...	1	-3	-13	-28
5	15.9	3	11.6	...	1	3	-1	-10
6	19.4	5	14.2	...	-1	5	4	-1
7	21.7	6	15.9	.	-2	6	7	3
8	23.0	7	16.9	.	-2	7	8	5
9	24.0	8	17.7		-1	8	10	7
10	23.8	9	18.2	..	3	11	11	8
11	22.2	11	18.3	.	9	13	12	7
12	20.2	13	16.1	-34	15	16	12	4
13	18.1	16	14.4	-6	21	16	9	-1
14	16.3	19	12.9	15	23	15	5	10
15	15.3	23	12.1	33	26	13	1	-16
16	14.5	24	11.5	38	25	11	-3	-22
17	13.8	26	11.0	42	24	8	-7	-28
18	13.3	26	10.5	43	23	6	-10	-33
19	12.8	27	9.1	43	21	3	-14	-38
20	11.9	27	8.4	41	17	-3	-22	
21	10.7	28	8.0	40	11	-12	-35	..
22	10.5	28	8.0	40	10	-14	-37	..
23	11.2	28	7.9	41	14	-8	-30	..
24	9.7	22	7.5	23	4	-20	...	

VK EAST — EUROPE (Long path)

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	10.4	2	7.0	-22	4	-6	-18	-38
2	10.2	6	6.9	-13	5	-7	-21	...
3	10.1	9	7.0	-5	5	-8	-23	...
4	9.8	13	6.9	3	5	-11	-28	...
5	9.1	17	6.4	13	3	-17	-38	...
6	9.3	23	6.7	23	5	-17	-39	...
7	11.2	25	8.1	31	14	-4	-21	...
8	14.2	23	10.4	29	23	10	-2	-19
9	12.0	19	9.2	9	16	5	-7	-24
10	11.4	11	8.7	-11	10	1	-9	-26
11	12.9	6	10.1	-32	7	2	-7	-21
12	12.0	-1	9.5		2	-1	-9	-22
13	11.5	-7	9.0	.	0	-2	-9	-22
14	11.0	-12	8.6		-1	-3	-9	-21
15	10.6	-15	8.2	..	-2	-3	-9	-21
16	10.0	-19	7.7	...	-2	-3	-10	-22
17	9.6	-27	7.3		-5	-7	-14	-28
18	10.0	-19	7.5	..	-2	-3	-10	-23
19	12.1	-10	9.5	...	-3	-2	-6	-16
20	15.4	-1	11.2	.	-3	1	-1	-8
21	14.2	-1	9.6	.	-1	1	-3	-12
22	12.2	-2	8.3	.	1	-1	-8	-20
23	11.2	-2	7.6	..	2	-3	-12	-27
24	10.6	0	7.1	-31	3	-4	-16	-33

VK SOUTH — EUROPE (Long path)

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.4	-2	6.5	-23	1	-11	-25	...
2	9.2	1	6.4	-13	0	-14	-31	...
3	9.0	5	6.4	-5	0	-17	-36	...
4	8.8	10	6.3	4	0	-21	...	...
5	8.3	14	6.0	12	-3	-29	..	.
6	8.6	21	6.3	22	-2	-29	...	...
7	10.3	23	7.6	28	8	-13	-35	.
8	12.9	22	9.6	27	18	3	-12	-33
9	15.0	20	10.4	19	22	11	0	-15
10	11.1	15	8.6	5	10	-4	-19	...
11	9.5	5	7.4	-9	3	-11	-27	...
12	11.3	3	7.8	-27	4	-3	-15	-32
13	10.7	-4	7.5	..	1	-5	-15	-31
14	10.1	-10	7.0	..	0	-5	-15	-30
15	9.7	-15	6.8	.	-1	-5	-14	-29
16	9.3	-29	6.6		-7	-11	-21	-37
17	9.1	..	6.6	..	-13	-17	-26	...
18	9.9	-27	7.2	..	-7	-9	-17	-31
19	11.7	-12	8.0	.	-3	-2	-7	-18
20	14.5	-4	10.6	.	-5	0	-3	-10
21	13.2	-6	9.2	...	-3	-1	-5	-15
22	11.3	-9	7.9	...	-1	-3	-10	-23
23	10.4	-8	7.2	..	0	-5	-15	-30
24	9.7	-6	6.7	-34	0	-8	-20	-39

VK WEST — EUROPE (Long path)

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.0	-13	6.2	-36	-2	-11	-24	..
2	8.7	-11	6.1	-28	-3	-14	-28	.
3	8.5	-8	6.1	-21	-3	-17	-33	...
4	8.3	-4	6.0	-13	-4	-21	-39	
5	7.9	-1	5.8	-6	-6	-26	...	.
6	8.3	5	6.1	0	-5	-26	.	...
7	9.9	11	7.4	4	2	-16	-34	..
8	12.2	15	9.2	9	10	-3	-17	-37
9	14.6	15	11.0	9	16	6	-4	-20
10	13.1	15	10.2	5	14	3	-8	-25
11	10.1	7	7.8	-7	3	-9	-24	.
12	9.9	0	7.7	-22	1	-9	-22	..
13	12.0	-1	8.1	..	1	-4	-12	-27
14	11.2	-8	7.5	...	-1	-5	-14	-28
15	10.6	-14	7.2		3	-6	-14	-27
16	10.0	-19	6.8	.	-4	-6	-13	-26
17	9.6	-30	6.6	.	-9	-11	-19	-34
18	9.2	..	6.4	..	-14	-17	-26	.
19	9.0	..	6.4	.	-17	-20	-30	.
20	9.7	-32	7.0	.	-10	-12	-20	-34
21	11.5	-15	7.7	...	-5	-5	-10	-20
22	10.9	-15	7.6	...	-4	-5	-12	-24
23	10.0	-17	7.0	..	-3	7	-15	-29
24	9.3	-16	6.5	..	-2	9	-19	36

VK EAST — MEDITERRANEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	10.0	0	7.7	-26	2	-8	-23	..
2	9.5	-9	7.2	-37	0	-9	-23	...
3	12.6	-2	9.5	...	1	-1	-8	-21
4	18.6	5	14.2	...	-1	5	4	-2
5	23.7	7	18.5	...	-3	7	9	6
6	26.4	8	21.2	...	-4	8	10	10
7	25.9	9	21.0	.	-3	8	11	9
8	24.7	9	19.8	.	0	9	11	9
9	22.9	10	19.3	.	5	12	12	8
10	21.0	12	16.7	...	11	14	11	5
11	18.8	14	14.9	-29	16	15	10	1
12	16.9	17	13.4	-6	20	14	7	-5
13	15.9	20	12.6	16	24	15	4	-10
14	15.0	24	11.9	34	26	14	1	-15
15	14.3	26	11.4	39	26	12	-1	-20
16	13.7	27	10.8	43	26	10	-5	-25
17	13.2	28	10.3	44	24	7	-8	-30
18	12.2	29	9.5	43	21	2	-16	.
19	11.0	30	8.4	41	15	-6	-27	.
20	10.7	30	8.2	41	14	-8	-30	
21	13.4	28	10.6	43	25	8	-7	-28
22	11.0	24	8.5	26	13	-5	-24	..
23	10.8	16	8.3	7	9	-6	-23	..
24	12.2	12	9.4	-12	10	0	-12	-30

VK SOUTH — MEDITERRANEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	10.1	-1	7.7	-21	-3	-16	-32	..
2	9.4	-11	7.1	-34	-6	-18	-33	...
3	12.7	-6	10.0	...	-4	-7	-15	-29
4	19.2	0	14.8	...	-6	0	-1	-7
5	22.6	1	18.9	...	-9	0	1	-1
6	22.6	0	18.7	...	-10	0	1	-2
7	22.7	0	18.5	...	-10	0	1	-1
8	22.3	0	18.1	...	-9	0	1	-2
9	21.3	1	17.0	.	-5	2	1	-3
10	19.9	2	15.7	.	0	3	1	-5
11	18.0	4	14.2	.	5	4	0	-9
12	16.0	7	12.6	-24	8	3	-4	-17
13	14.3	11	11.3	0	11	1	-11	-28
14	13.3	16	10.5	20	13	-2	-17	-38
15	12.4	18	9.8	27	12	-6	-23	...
16	11.9	20	9.4	31	10	-9	-28	..
17	11.5	21	9.0	34	9	-12	-33	.
18	11.1	22	8.6	34	7	-15	-37	..
19	10.5	22	8.1	33	4	-20	.	..
20	10.0	22	7.6	32	1	-25	...	..
21	10.4	22	7.9	33	4	-21	...	...
22	12.7	19	9.5	31	13	-4	-22	...
23	11.9	15	9.2	14	9	-6	-23	...
24	12.5	10	9.7	-2	7	-4	-18	-38

VK WEST — MEDITERRANEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	9.3	13	7.1	7	0	-22	..	.
2	8.7	2	6.6	-8	-3	-23	...	
3	11.6	3	9.2	-31	3	-5	-18	-37
4	17.3	7	13.3	...	6	7	2	-7
5	22.2	8	16.9	..	4	10	9	4
6	22.6	8	18.9	..	2	9	9	5
7	22.7	8	18.8	...	1	9	9	5
8	22.7	8	18.6	.	1	9	9	5
9	22.3	8	18.1		3	10	9	5
10	21.3	9	17.1	.	6	11	9	4
11	19.8	11	16.7	.	11	12	9	1
12	18.1	13	14.3	-21	16	13	7	-4
13	16.2	17	12.8	5	20	12	2	-12
14	14.5	21	11.5	26	22	9	-4	-24
15	13.6	23	10.8	35	21	5	-10	-32
16	12.9	25	10.2	39	20	1	-16	
17	12.4	26	9.8	42	18	-1	-20	
18	11.9	27	9.4	42	17	-4	-25	
19	11.5	27	9.0	42	15	-8	-29	
20	10.7	28	8.3	40	10	-14	-38	.
21	9.8	29	7.5	39	4	-24	.	.
22	9.8	29	7.5	39	4	-24		
23	10.8	29	8.3	41	12	-12	35	.
24	10.4	23	8.0	28	8	-14	-37	

VK EAST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	22.7	9	19.2	...	4	10	10	6
2	20.2	10	16.0	...	8	11	9	2
3	17.4	12	13.8	-37	12	11	5	-4
4	15.2	14	12.0	-12	16	9	0	-14
5	14.1	18	11.1	8	18	8	-4	-21
6	13.6	23	10.7	27	21	7	-7	-27
7	13.1	25	10.4	35	22	5	-10	-32
8	12.8	27	10.0	39	22	4	-12	-35
9	12.5	28	9.7	43	21	3	-14	-38
10	11.5	29	8.9	42	18	-3	-22	..
11	10.0	31	7.7	40	10	-15		.
12	9.8	31	7.5	39	8	-17	.	.
13	12.3	28	9.7	43	21	2	-16	
14	11.4	26	8.9	33	15	-4	-23	.
15	9.9	19	7.6	16	6	-15	-36	
16	12.3	14	9.5	-2	12	0	-13	-33
17	10.9	6	8.4	-19	5	-6	-20	
18	10.5	-2	8.0	-35	1	-7	-20	.
19	13.2	0	10.0	..	1	0	-7	-20
20	17.7	4	13.7	...	0	4	2	-4
21	21.4	6	16.8	...	-2	6	6	3
22	23.0	7	18.4	...	-4	6	8	5
23	23.9	7	19.4	...	-3	7	9	6
24	24.9	8	20.0	..	-1	9	10	8

VK SOUTH — USA/CARIBBEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	23.2	10	17.4	...	4	11	11	8
2	21.7	11	17.3	...	9	13	12	6
3	18.7	13	14.9	-36	14	14	9	0
4	16.4	15	13.0	-12	18	12	5	-7
5	15.2	19	12.0	8	21	12	1	-14
6	14.7	22	11.6	25	24	12	0	-17
7	14.0	25	11.2	34	24	10	-3	-23
8	13.6	26	10.7	39	24	9	-6	-26
9	13.2	28	10.3	43	24	7	-8	-30
10	12.0	29	9.3	42	20	0	-17	..
11	10.2	30	7.8	40	11	-13	-36	..
12	9.8	31	7.5	39	9	-16	...	.
13	12.2	28	9.7	42	20	1	-17	..
14	11.8	25	9.2	33	17	-2	-20	.
15	11.4	19	8.8	15	12	-4	-21	..
16	10.8	11	8.3	-6	6	-7	-24	.
17	10.2	2	7.7	-21	2	-10	-25	..
18	10.5	-3	7.9	-37	1	-7	-19	-39
19	12.8	-1	10.1	..	1	-1	-8	-22
20	16.4	3	12.5	..	0	3	0	-7
21	19.6	5	15.2	...	-3	5	4	0
22	21.6	6	17.1	...	-4	5	6	3
23	22.3	7	18.1		-3	6	7	4
24	22.9	8	19.0	...	-1	8	9	6

VK WEST — USA/CARIBBEAN

UTC	MUF	dBU	FOT	7.1	14.2	18.1	21.2	24.9
1	21.9	9	17.8	...	-2	7	9	6
2	19.9	9	15.8	...	2	9	8	3
3	17.2	9	13.6	.	6	9	5	2
4	14.9	10	11.8	.	9	8	1	-10
5	13.8	12	10.9	-24	12	7	-2	-16
6	13.3	16	10.5	-6	15	7	-4	-20
7	12.8	21	10.2	12	18	6	-7	-26
8	12.5	27	9.8	32	22	6	-9	-31
9	12.4	29	9.6	38	23	6	-10	-33
10	11.5	31	8.9	42	20	1	-18	.
11	10.0	33	7.7	41	13	-10	-33	
12	9.9	33	7.6	41	13	-11	-34	...
13	12.4	31	9.8	44	24	6	-11	-34
14	12.6	28	10.0	37	23	6	9	-32
15	10.9	23	8.5	20	15	-2	-19	
16	10.7	17	8.2	4	11	-3	-19	
17	11.5	10	8.9	-15	9	-1	-13	-33
18	10.8	3	8.3	-30	5	-3	-15	-34
19	10.2	-5	7.8	.	3	-4	-16	-34
20	10.4	-9	7.9	.	1	-3	-12	28
21	12.7	-4	10.1	.	0	0	5	-16
22	16.3	2	12.5	.	-3	3	1	-4
23	19.5	5	15.2	.	-5	4	5	1
24	21.3	7	17.0	..	-5	5	7	4

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● FIVE Hilltop acres excellent HF/VHF. Erect tower of your dreams amid tranquility character full home 12 mins from main shops 15 to superb beaches in go ahead Gosford $365,000. Write Dave Bell, RMB 5445, The Ridgeway, Holgate Gosford NSW 2250.

● YAESU FT101ZD vgc new 6146B finals microphone manual serial no. 120956 $550 ono. Herb VK2UJ QTHR (068) 65 3213.

FOR SALE VIC

● KENWOOD TH25AT handheld 2 m FM transceiver c/w mobile headset (vox operated), nicad battery pack & charger, DC car adaptor, speaker/mic $450; 2 m 12 el Werner Wulf Yagi $100; 6 m 6 el Werner Wulf Yagi $150; 70 cm Skybeam 21 el Yagi $150. Mike VK3XL (03) 660 4310 BH or (03) 703 2729 AH.

● YAESU 707 HF SSB base or mobile station comprising FT707 transceiver s/n OH-50022 FP707 power supply s/n OE-010483 FC707 antenna tuner and dummy load s/n OF-010860. WARC bands all with manuals, total $750; HOXIN HF-5DX HF band vertical trapped antenna with aluminium mast $80; HEAD Phones and Morse key $40. Owen VK3ON QTHR (03) 457 3425.

● KENWOOD 440S HF tranceiver with built in ATU very good condition, seldom used $1,400. Ian VK3MZ Ringwood (03) 876 3643.

● KENWOOD TS520S (with CW filter) together with speaker (SP230) and MC35S noise cancelling microphone and original operating manual $600. Derek VK3DD (03) 730 1557.

● ALINCO DR-112 2 m 5/45 watt mobile xcvr with both manuals cradle mic as new in box little used $425; TIMEWAVE audio noise eliminator DSP-9 kills all noise, brand new in carton, retail $339 Sell $239. Max VK3GMM (059) 85 2671.

● ICOM IC-2400A 2 m/70 cm FM transceiver s/n 01805 wide Rx with original packaging, manuals, accessories, etc as new condition. Antenna specialist thru-glass 2 m & 70 cm whips. Supplied with new re-mount kits ec. Best Offers. Adam VK3ALM QTHR (015) 36 2799.

● SATELLITE DISH 1.5 metre Andrews spun aluminium $120; KU Band LNC $25; PLESSEY 12A LNC $15. VK3BCU (03) 390 2609.

FOR SALE QLD

● HEATHKIT SB201 HF linear amplifier factory assembled mint condition with manual and spare pair 572B tubes 1200 W pep 80-10 m $700; DICK SMITH 80/40 m mobile SSB/CW digital txcvr vgc with manual and Mobile One whip $175. "Doc" VK4CMY (076) 85 2167.

● YAESU FT207R 2 m HT AC DC chargers remote speaker-mike manual $240; YAESU FT208R 2 m HT AC DC chargers remote speaker-mike manual $300. Peter VK4APD QTHR (07) 397 3751 AH.

● CREED model 75 teleprinter w/original PSU, manual. This most compact of Creed range is in excellent condition — a rare collector's item $100 plus freight. John VK4SZ QTHR (070) 61 3286.

● ICOM 275H 2 m 100 W all mode VHF transceiver, very little use, perfect condition, mike, manual, original carton etc. $1,800. Peter VK4PO QTHR (07) 843 0505.

FOR SALE SA

● YAESU linear FL2100B serial 4H303003 plus two new valves 572B/T160L and books, one owner, deceased estate, $600 ono. Bob VK5QJ (08) 379 1845.

FOR SALE WA

● PC BREEZE II CAD programme for PCB artwork, complete with manual $70. VK6EQ QTHR (09) 277 3583.

WANTED ACT

● PANBRAKE — small sheet metal bender or similar. HT transformer for pair 813s ie approx 900 V at 0.5-1 amp for voltage doubler or 1800 V for bridge (my ex Admirality transformer finally failed in a spectacular way) for cash or willing to swap four new Mil spec 6146B's or metal cased vacuum variable 30-1000 PF at est 7.5 kV with cash adjustment. Keith VK1KG QTHR (06) 292 6464.

WANTED NSW

● PLUG IN coils for Heathkit GD1-U grid dip oscillator. Malcolm VK2BMS QTHR (02) 257 4583 BH or (02) 958 1114 AH.

● YAESU SP101PB speaker phone patch console. Valve type 1T4. Ray VK2FW QTHR (063) 65 3410.

● HRO coil box type E 960 kHz to 2.05 MHz (approx); pick up head for Edison Diamond Disk model L-35; Chassis for AWA Radiola model C-66 (approx 1930), any condition; Magnavox horn speaker driver unit, approx 1926. Stan VK2EL QTHR (044) 55 5825.

WANTED QLD

● OLD SCOUTS who knew "Fox" Alf Chappel, Woodford 7th May 1995 "40" years scouting celebration. For more information contact Fred on (074) 96 1186 or (018) 06 0315 or write to PO Box 17, Woodford Qld 4514.

WANTED SA

● RECEIVER type Sky raider 12 made in 1940 also Type 3 Mk II parts. Brass plates from receiver and p/supply band knob, volume knob. Key, any spares etc. Circuit for ATR2B. Andy VK5AAQ (08) 322 1010 AH.

WANTED WA

● ICOM IC251 and ICOM IC451, very good condition only. Bill VK6ACY (09) 242 2420.

MISCELLANEOUS

● THE WIA QSL Collection (now Federal) requires QSLs. All types welcome, especially rare DX, pictorial cards, special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

■ Antennas, Towers, Lines, etc.

How Good is Your Connection?

Des Greenham VK3CO (now a Silent Key) points out some traps with coaxial cable plugs and sockets.

Recently I had occasion to inspect a coaxial cable connection using the standard PL-259 plugs and a female to female connector. This joint had been in use for some time and, when I removed the covering tape, I found the PL-259 plug tongue was corroded. Obviously, the connection had not been positive.

I cleaned the centre tongue and then carefully plugged it into the SO-239 socket. To my surprise it fitted loosely with no positive tension presented by the socket. We invariably tighten the outer ring assuming the inner is making good contact. With this alarming situation in mind, I decided to go further and see what connection was made with other SO-239 sockets.

I checked and ascertained that the pin on a standard PL-259 plug is exactly 5/32" in diameter. By using the shank of a 5/32" drill bit, it is a very simple job to check the fit and tension of any SO-239 socket. I looked out all my connectors, PL-259 to BNC, etc and, to my surprise, I found several of them had little or no contact pressure. So, I went further and inspected the outlets of my transceivers, only to find that some were also providing a doubtful connection.

As a result of these investigations, I am sure that this may be the answer to many of the intermittent problems experienced by operators. By removing the PL-259 plug and reinserting it, a better connection is achieved and this may well cure the problem.

Having found this alarming condition, the next question that comes to mind is "how to fix it?"

The centre piece of most SO-239 sockets is split into 4 segments and by using a sharp thin blade, eg a small instrument blade screwdriver or a Stanley knife, it is possible to push this down in between the socket and the insulation and slightly bend the segments in towards the centre. This increases the tension on the centre of the inserted plug. Care must be taken NOT to bend the socket too much otherwise the plug cannot be inserted at all!

By carefully carrying out this operation on all my SO-239 sockets I am now confident that I have a good coaxial connection not only on the outer braid but also on the more important inner!

Have a quick check of the coaxial sockets around your shack — you may be surprised at what you find!

ar

Hamads

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